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ABSTRACT

On March 3, 1971, a symposium was held at Oklahoma Christian College in order to discuss learning centers at the higher education level. For the purposes of the symposium, a learning center was defined as: (1) having a variety of audio and visual learning paths; (2) containing both print and nonprint resources; (3) affording opportunity for independent learning through audio and visual experiences; and (4) being integrated into the total curriculum. The topics of discussion contained in this volume are: (1) The learning center in the '70's; (2) Is the learning center concept valid for education in the '70's?; (3) What corporate doners expect of education in the '70's; (4) Integrating learning centers into the total school; (5) Evaluating learning center programs; (6) Building design for learning centers; (7) Preparing materials for learning centers; (8) Equipping learning centers; and (9) Determining cost of learning centers. Included are status reports of existing learning centers at nine colleges, junior colleges and universities. Learning centers with the goal of personalized instruction are seen as an important aspect of education in the future. (Document previously presented in RIE as ED 053 536.) (SJ)

What are we learning about Learning Centers?

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WHAT ARE WE LEARNING ABOUT LEARNING CENTERS?

Edited by
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Introduction

One of the most significant instructional developments of the 60's was the introduction of the learning center into many instructional programs. These learning centers have taken many different designs and purposes, contained many different types of equipment and resources, and been used from elementary schools through universities.

With several years of experience in these learning centers now available for analysis, it is important to examine the results to date. Some have said that the concept has been "oversold"; others have applauded it as an outstanding success.

On March 3, 1971 Oklahoma Christian College brought together one hundred fifty persons with interest and experience in learning center usage, along with several outstanding consultants, in a symposium examining the question "*What Are We Learning About Learning Centers?*"

In addition to the more philosophical consideration of the learning center concept, the symposium provided an opportunity for nine learning center directors to report on their experience in planning, organizing, and operating their centers.

This book contains reports, speeches, and discussions of the symposium. Some are given verbatim; others are summarized due to the nature of the reporting method.

CHARACTERISTICS

of a Learning Center

In instructional design	a variety of audio and visual learning paths used.
In resources	both print and non print resources available.
In student activities	affords opportunity for independent learning experiences.
In facilities	designed for independent learning through audio and visual experiences.
In curriculum	integrated into the total instructional program.

THE LEARNING CENTER IN THE SEVENTIES

EARL J. McGRATH
Former U.S. Commissioner of Education

The concept of the learning center involves several paradoxes. The most puzzling of these anomalies springs from the idea that institutions dedicated to higher education should find it necessary to establish an internal unit devoted to the very purpose for which the entire enterprise putatively exists. Are not colleges and universities established primarily to furnish the special facilities and conditions under which students with a wide variety of abilities and interests can make the maximum use of their time and energy in learning? The basic reasons for calling these relatively recent innovations "learning" centers are not entirely clear. One explanation must be the feeling among their advocates that these centers are especially effective in enabling students to gain something more in intellectual content and skills in the learning center than they would accomplish under conventional academic circumstances. Another explanation for the burgeoning of learning centers may be the growing influence of learning theory in highlighting the basic differences between teaching and learning.

Much teaching in college and university classrooms results in only a modest amount of meaningful, functional, and lasting learning. It is now demonstrable that even under the instruction of a teacher well-versed in his subject and dedicated to his job some students learn at a level of efficiency far below their potential. The reverse is also true; some students receiving instruction from teachers with less impressive formal qualifications and with quite unconventional procedures acquire an impressive body of knowledge, master complicated intellectual skills and most important of all develop such an interest in the things of the mind that they continue to learn long after they have been weaned from the classroom.

Some of the most disturbing research of recent years done by Bloom, Carroll, and others of the conditions of the learning situation reveals that many students learn below their abilities, or fail entirely, in courses in which if the conditions of learning were based on what is already known about differential human capacities and effective learning situations, they would have no difficulty in rising to superior levels of achievement. Benjamin Bloom, of the University of Chicago, has written that:

> The use of aptitude tests for predictive purposes and the high correlations between such tests and achievement criteria have led many of us to the view that high levels of achievement are possible only for the most able students. From this, it is an easy step to some notion of a causal connection between aptitude and achievement. The simplest notion of causality is that the students with high levels of aptitude can learn the complex ideas of the subject while the students with low levels of aptitude can learn only the simplest ideas of the subject.
>
> Quite in contrast to this is Carroll's (1963) view that *aptitude is the amount of time required by the learner to attain mastery of*

> *a learning task.* Implicit in this formulation is the assumption that, given enough time, all students can conceivably attain mastery of a learning task. If Carroll is right, then learning mastery is theoretically available to all, if we can find the means for helping each student . . .
>
> We are convinced that the grade of A as an index of mastery of a subject can, under appropriate conditions, be achieved by up to 95 percent of the students in a class . . .
>
> We believe that if every student had a very good tutor, most of them would be able to learn a particular subject to a high degree.*

Another anomaly relates to the wide differences that exist between the patently effective materials and procedures employed in the relatively few existing learning centers among the more than 2,500 institutions of higher education and the materials and procedures in general use elsewhere. The "culture lag" which the celebrated sociologist, William Ogburn, identified in social institutions at large is particularly pronounced in the academic society. Methods of teaching with the use of audio-visual aids, for example, developed with millions of dollars of grants from the Ford Foundation to mention only one investor, in spite of their demonstrated effectiveness, have not been so widely adopted as the evidence and investment would seem to demand.

Now it is neither my wish nor my intention to engage in today's most popular emotional catharsis of flagellating the

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**Benjamin S. Bloom, "Learning for Mastery," Evaluation Comment, 1:2 (May 1968).*

academic establishment. If, however, we are to make better use of the available resources of human beings, buildings, and equipment, which will be much harder to come by in the 70's than they were in the 60's, the conditions of learning must be vastly improved in terms of what we already know, to say nothing of the future products of a considerably enlarged research effort. The purpose of these general prefatory remarks has been to suggest that learning centers can contribute significantly to the advancement of efficiency in higher education in this decade. The same could be said about learning at all the other levels of our school system, but that is not now our concern.

My treatment of our topic makes no attempt to catalogue the many interesting and productive activities which learning centers carry on. Nor shall I attempt to review in detail the abundant reliable evidence on the effectiveness of their work. I assume that most of those interested in these educational units are familiar with this information. Moreover others more directly in touch with these facts will present them in this meeting. It is my conviction that to get the most comprehensive understanding of the ways in which learning centers can assist in the improvement of higher education in the years ahead, one must consider certain probable developments in American society that will impinge on the programs of these agencies.

Without attempting to exhaust the list of potential influences, I wish to identify five: (1) A decelerating growth in student enrollments. (2) The general abandonment of highly selective admission standards. (3) A rededication of the members of the profession of education to their primary responsibility of nurturing efficient learning among their students. (4) The now generally accepted concept that no amount of formal education, however effective, will prepare any one to be for long an efficient practitioner of his calling, an informed and participating citizen, or a well adjusted and happy human being. Thoughtful observers of American society are committed to the view that continuing education throughout life is now as essential as eight years of schooling was considered adequate only fifty years ago. (5) A slowing down of the geometric increase in financial support of higher education from legislatures, corporate donors, and private philanthropists.

ENROLLMENTS

1. So many studies have been made of enrollments and so much has been written on the subject that only a few observations relevant to our particular subject need be made. Enrollments will continue to grow, but after 1975-76 the rate of increase should begin a dramatic drop. After a period of sky rocketing increases from the days of World War II to 1957 the number of live births in the United States began to fall at a rate of about 100,000 a year. Hence, the reservoir of youth from which colleges and universities can draw has now fallen more than a million below the level of 1957. Since those born in that year will normally be old enough to enter college in September 1974 or 1975, a pronounced impact of the falling birth rate will be felt only three or four years hence. To be sure, with a total present enrollment of over eight million, the real effect of this shrinkage will not for several years be substantial. Each year, however, with the exception of the few prestige institutions which have steadily had many more applicants than could be admitted, this contraction of enrollments in a good number of colleges will be painfully

perceptible. Secondly, there has been a constantly increasing percentage of the college age group seeking a higher education. This proportion may continue to rise. It should be recalled, however, that already nearly fifty percent of young people now continue their formal education beyond high school, and in some communities, especially those economically and socially well favored, virtually all mentally unimpaired youth now go on to college. The percentages cannot rise much higher. A few years ago, under a grant from the Ford Foundation, I conducted a conference on the subject, "Universal Higher Education."* Even among the staunchest advocates of extended opportunity for all American youth, the opinion was general that a top figure of 70 per cent of college attendance must realistically be considered a limit, and some considered a lower estimate sounder. With a reduced population to draw from and a less rapid extension of higher education to new groups the effect on enrollments is obvious. The consequences in terms of teaching staff, classrooms, equipment, dormitories, and other features of institutional life have not yet been fully appreciated, and most of them are too far afield from the present topic to discuss them now.

Several results of changing enrollment patterns are directly relevant to any consideration of the future of learning centers. The most obvious is the opportunity the members of the profession, especially the harassed administrators will now have, to turn their attention and energies from an impenetrable preoccupation with the enlargement and readjustment of all features of the academic community to more genuinely educational issues. Even the stoutest defenders of our system

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Earl J. McGrath, ed., Universal Higher Education (New York: McGraw-Hill Book Company, 1966).

of higher education among whom I count myself, since the end of World War II have expressed arresting misgivings about the loss of steady purpose, the impersonalization of human relations, the underdirected improvization of policies and procedures, and the loss of meaning imposed by the kaleidoscopic conditions imposed on academic life by the need to absorb more and more students. It is no surprise, therefore, that the resulting lack of attention to the individual caused the students to fail, to withdraw, and to latterly rebel.

One can hope that, relieved of the urgent practical concerns of absorbing more and more students, administrators and faculty members may now be able to institute the experiments and reforms required to provide a more effective education for a more stable student body. In these efforts the learning centers ought to be one of the first instruments to be given fuller consideration.

My conception of the principal functions of the learning center embraces the idea of personalized opportunities geared to the interests, abilities, and time schedules of each student. Because of the faculty's increasing concern with, and knowledge of, the individual student, and the wide range of optional facilities in the learning center, each learner can be considered as a special case. He can be directed to those materials and procedures which will take him where he is in his intellectual development at any point in time and move him forward at a rate consistent with his capacity to learn. And procedures can be calibrated to a student's strength in a field like languages or weaknesses in another like mathematics or vice versa. One of the most disturbing but insightful looks of our day, *Future Shock* by Alvin Toffler, is filled with facts and proposals relevant to the learning center concept. Speaking of only one technological device he observes that:

> Computers . . . make it easier for the school to cope with independent study, with a wider range of course offerings and more varied extracurricular activities. More important, computer-assisted education, programmed instruction, and other such techniques, despite popular misconceptions, radically enhance the possibility of diversity in the classroom. They permit each student to advance at his own purely personal pace. They permit him to follow a custom-cut path toward knowledge, rather than a rigid syllabus as in the traditional industrial era classroom.

Reverting for a moment to enrollments, it should be observed that the fastest growing institution in our system of higher education is the community college. For a number of academic, fiscal, and sociological reasons the remarks made earlier about shrinking enrollments will not for some years apply to these local institutions. The relevance of this matter here is that the community colleges generally attempt to provide a broad range of educational opportunity geared to the widely varying needs of all young people in a given social setting. The diversity of interests, abilities, and learning pace is bound to exceed those of the past. Hence, the curricular options as well as the opportunity to learn at varying speeds which characterize the learning center are peculiarly adapted to the growing needs of students in the community colleges. Moreover, a point to be considered later, these institutions are established to serve students of all ages and occupations at almost any hour. Hence, their students will vary even more widely than unselected undergraduates. The learning center can provide opportunities for varied curricular interests, for different rates of learning, and for irregular hours of attendance for these varied patrons.

CHANGING ADMISSIONS POLICIES

2. One of the most radical alterations of academic policy in the past decade which will doubtless be of considerable significance in the future of learning centers concerns admissions policies. From the end of World War II until the upsurge of minority groups in the 1960's it was the rare institution of higher education which did not almost annually erect higher barriers to admission based primarily on achievement in cognitive learning. This narrowing of the range of acceptable academic ability, and concommitant restriction of educational opportunity, was justified on the questionable assumption that these practices improved the quality of institutional performance. If the activities of the blacks had had no other effect on higher education, their demands that the validity of the means of determining the right to a college education be re-examined would have been a major contribution to the improvement of American higher education.

The fact is that a number of serious students of the relation between restrictive admissions practices and educational results had already shown that a large percentage of the failures or voluntary drop-outs came to college with good records. Conversely where unqualified students in terms of current criteria were admitted on an experimental basis many achieved acceptable, or even distinguished, records in subsequent education and in their professions. Some of these nonqualified students make quite satisfactory progress without so-called remedial instruction; others, as might be expected, had to fill gaps in their earlier education and the majority had to spend more time day by day on individual assignments and more years in completing degree requirements.

The cost in time and money of the necessary special services involved in providing additional instruction has been discovered to be unexpectedly large. In some instances the excessive expense has actually caused some institutions to limit the intake of those who cannot meet conventional standards.

Whatever the final outcome of the efforts of individual institutions to open more widely the doors of educational opportunity and to provide the type of instruction each individual requires, the social forces now at work, combined with the recognition that time must be considered an essential function of achievement, will doubtless result in a broader spectrum of abilities among students on admission. If, however, the educational needs of these new patrons of higher education are to be accommodated, within the limits of available resources, arrangements must be made for them to learn by themselves at their own pace. Some such accommodations to uneven ability can be made within the usual class structures and procedures. For many, however, special facilities will have to be provided.

Other than the learning center, no prospective agency or unit now on the academic scene appears able to meet these emerging needs of a diversified student group who stand much lower than at present in their high school classes. For many what is needed is additional time to repeat a given learning task as often as is necessary and self-administered criteria of accomplishment to indicate the next step in intellectual advance. As one who for nearly a half century has been intensely involved in the learning of foreign languages on a personal as well as professional basis, I can say that the use of audio-visual aids like those available in a learning center are indispensable. The resources they provide for direct experience with the spoken language, with limitless opportunity for repetition in the use of idiomatic expressions and peculiar structures, with playback arrangements, and many other aids to learning, these centers may be the only practical devices capable of assuring that some students will be able to master a foreign language at all. Even for the facile language student the learning center may make the difference between nonfunctional language knowledge and fluent usage, or between learning a single, or two or three new tongues during the undergraduate year. For graduate students in non-language fields who sometimes delay their degrees to dispose of generally footless but nevertheless inescapable language requirements, the learning center may be an indispensable help. The same can be said of other types of instruction, indeed of almost any kind, in which the individual student needs help as an integral part of a course, or wishes to raise his accomplishments above required levels.

It must be clear that I am not suggesting that the learning center should be merely an assemblage of prosthetic devices calculated to enable the scholastically crippled to make satisfactory intellectual progress; I am merely contending that we should recognize fully that human beings differ in the speed with which they learn, and that individual treatment enhances their accomplishments. The learning center includes the most comprehensive organization of devices and procedures yet devised to assist the individual in making the maximum progress in intellectual growth. With the increasing diversity of students, with the expansion of knowledge, with the demand by the public generally that the funds provided for education be put to the most productive use, it is hard to see how an alert educational community can function effectively without the services a learning center can provide.

REDEDICATION OF THE PROFESSION TO TEACHING

3. One of the most promising aspects of higher education today is the prospect that there is an incipient renewal in the profession of a real dedication to teaching, especially at the undergraduate level. One cause of this revival of interest is the unavailability of other kinds of professional employment such as doing research for industry and government, teaching a contracting company of graduate students, and serving in consultative bodies. One small college which three years ago had to search country-wide for a physics teacher this last summer had 29 unsolicited applications for the same position. The unavailability of other employment may not be the best motivation for inspired teaching, but it may in the long run produce many effective members of the profession. Moreover, a recent study conducted by the Institute of Higher Education at Teachers College, Columbia University, and published under the title, *The Dynamics of Academic Reform,** reveals, among other things, that significant changes in educational practices are facilitated by an infusion of new ideas from persons from other institutions and other occupations. Without elaborating these ideas on the changing composition and mores of the teaching profession, I belie that the years ahead will witness a willingness, yes, an unprecedented eagerness, to modify the academic enterprise so as to make it more responsive to the contemporary needs

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**J.B. Lon Hefferlin, The Dynamics of Academic Reform (San Francisco: Jossey-Bass, 1969).*

of students and of society. Sociologist Ogburn's quarter century "culture lag" between the discovery and use of knowledge may be considerably narrowed.

Specifically, the teaching profession for a number of reasons in its rededication to the obligations of instruction may accept, indeed seek, the constantly growing facilities and practices of the learning laboratory. If this is to happen, however, intensive efforts must be made to educate the profession concerning the value of the services such a unit can offer, not as an adjunct reparative or corrective agency, but as an integral part of the manifold activities of all discipline.

The fact is that even some of us who spend our professional lives in the study of education are not sufficiently abreast of the remarkable developments that have taken place in these innovative institutions. Oklahoma Christian College has rendered a valuable service in bringing together here a group of persons who have had considerable experience with this type of enterprise and who are capable of giving leadership in spreading the body of knowledge and experience which has already been acquired.

But much more needs to be done. Some foundation could gain a large return on its investment if it supported not only additional experiments and researches on the potentially beneficial use of learning centers, but also on mechanisms for currently disseminating knowledge about practices of demonstrated value. In any event, I believe the changing attitudes of teachers in the various disciplines, and their reaching out for innovation make the 70's a propitious time to extend the learning center concept throughout the enterprise of higher education. It should be added parenthetically that the kinds of facilities and services the learning center offers can be used in a great range of institutions and organizations outside of colleges and universities, especially in government and industry, but those possibilities lie beyond our present concern.

CONTINUING EDUCATION

4. The most arresting of the potential uses of the learning center relates to the idea long expounded in commencement addresses but until recent years not taken very seriously by the profession of the graduates, that education must be a never-ending human activity and commitment. There is growing agreement not only among educators, but among citizens at large as well, that learning and life must be coterminous. Evidence of the general acceptance of this view is the change of the name "adult education" to "continuing education." No longer do we think of this type of program only as an opportunity to bring those who have been out of school for a decade or more up to a level they might have achieved if they had not dropped out, or as the means of quickly acquiring the new knowledge or skills needed for a new job.

Colleges and universities will, of course, offer all kinds of instruction in conventional classes for those who want either to acquire additional education for vocational advancement, for general intellectual development, for more enlightened citizenship, or for the sheer fun of learning. With the increasing leisure which we are led to believe will be abundantly available to all in the social empyrean just ahead, those who already know the pleasures of the life of the mind may hope that these rich and life-extending satisfactions might be chosen in part as substitutes for the present endless hours of placid absorption in TV programs.

There are many reasons why the prospective adult learner today will not be drawn to conventional courses designed primarily for undergraduates. Even the latter are less and less enthralled by the routines, and the remoteness from life of many classroom experiences. As a teacher of adult classes in several disciplines I can say with some confidence that the failure of adult education to live up to its demonstrable potential in the past forty years has in large part been the result of a lack of innovation on the part of those who teach in adapting instruction to the varying interests and needs of highly motivated but critical adult patrons of the academic market.

The learning center can provide an ideal arrangement of materials, time schedules, and differential learning speeds for the millions of persons from 18 to 80 who want for a variety of reasons to keep intellectually alive. For the out-of-school person these individualized services will be indispensable. Moreover, regardless of the engulfing growth of publicly-supported higher education, the development of learning centers in the smaller liberal arts colleges may in fact be one of the most effective devices for attracting a larger constituency of students as well as potential benefactors. The demand for this type of service is already evident even in such well-educated communities as Westchester County, New York. Here a group of adults each year on their own with no institutional backing or involvement organizes a variety of instruction in the modern languages, the fine arts, political institutions and practices, and a host of other subjects of vital interest even to many who already hold Ph.D., LL.B., or M.D. degrees. The availability of a learning center for these citizens would greatly increase participation, because many of them follow highly demanding occupations and are not completely free in arranging their own schedules in after working hours.

The learning center can also capitalize on one element in the educational process which has immense potential. It can not only accelerate the acquisition of new knowledge, it can through guided independent study facilitate the cultivation of the habits of intellectual workmanships and stimulate students' motivation toward continuous self-instruction. The psychological and pedagogical fruits of student involvement in the learning process were described by John Dewey a half century ago. But these views of America's most celebrated educational philosopher have been overlooked by those who know more about Admiral George and Governor Tom than about Philosopher John. Even the alleged responsibility of colleges for much of today's permissiveness blinds many to three of the cardinal principles in Dewey's philosophy.

One is that any program of education has to begin where the student is intellectually and motivationally. No matter how competent a teacher may be in his discipline if he starts beyond the students' level of comprehension he is wasting his own and the student's time. In theory every teacher agrees with this principle, but many observe it more in the breach than in the practice. The learning center program not only rests on this fact of learning theory; it involves it in the preparation and use of its materials of instruction.

Second, said Dewey, making the learning experience real through the use of the concrete, undergirded by theoretical explications, increases the speed of acquisition and assures longer retention. The learning center properly makes maximum use of media.

Third, and most important, active rather than passive participation in the learning process excites interest in, and cultivates the habit of independent study and personal responsibility for further growth in unrelated intellectual exercises. In fact, such self-learning doubtless nurtures character traits of persistence and responsibility for one's own destiny.

COSTS

5. Lastly, the matter of costs. Others at this meeting from systematic study and personal experience know so much more about this matter than I, that I hesitate to express opinions on this very complicated topic. As a matter of fact, I believe that the learning center concept ought to be sold more on the basis of its academic quality and uniqueness than on fiscal considerations. There are, in fact, some teaching situations in which the facilities of the learning center might add to the cost of instruction, and properly so. For example, some courses in the graphic arts of music are offered primarily through the use of the lecture-discussion method. But the students' experiences could be greatly enriched by the extensive use of auditory and visual materials by extending the variety of artistic expression and by strengthening and consolidating what is learned. Certain it is that the initial expense of designing, erecting, and equipping an individual learning place for each student so that he can gain these learning increments will exceed the cost of providing bare classroom

space. But the advantageous outcome would amply justify the additional cost.

But in two respects at least, the funds for current operating expense could either be reduced or put to better use through the inclusion of a learning center as an integral part of the institutional program. As observed earlier the enrollment boom, especially for some of the smaller private colleges, will in four years be over, as indeed it already is for some. If many colleges are to operate with financial stability and still offer a proper range of curricular options, while maintaining suitable salaries, they will have to find ways of reducing the exhorbitant costs of advanced specialized courses which year after year attract fewer than five or even ten students. A few years ago colleges used to boast about their 5 to 1 student-faculty ratio and accrediting agencies took a dim view of an institution which believed it could double or triple that ratio without adulterating the quality of education. The myths on which these policies were based are happily evaporating.

Some small classes will always be a practical necessity. The only realistic solution to this problem where such courses really constitute proper elements in a college program as distinguished from graduate and professional school offerings will be to shift a large part of the burden of instruction to the student through various forms of independent study. For 100 years tutorial arrangements of various types have been tried throughout the enterprise of higher education. In fact, the practice in England in one form or another antedates the establishment of Harvard in 1636. Regardless of its pedagogical merits, for most institutions the one-to-one relation between teachers and students has turned out to be prohibitively expensive. Moreover, tutorial instruction has typically been limited to upper classmen with superior records who in terms of the acquisition of the skills of learning need its peculiar benefits least. The learning center can reduce the teaching load by making meetings between teacher and student less frequent. Indeed, in many cases these visits might be reduced to those needed to smooth the students' advance over intellectual bumps in the road.

In the case of some instruction in limited but justifiable demand the facilities of the learning center may make the difference between offering a course or eliminating it completely and thus impoverishing the progress of some students. Students proficient in French, for example, with only minimal assistance can gain a fair competence in Spanish, Italian, and Portuguese. The same arrangement could suffice for the learning of courses in mathematics. With imagination and facilities cost could thus be reduced without the sacrifice, in fact, sometimes with an increase in the efficiency of learning. My guess is that corporations, foundations, and private donors, as they consider prospective grants in the future, will be increasingly inquisitive about the efforts institutions have made through the use of these devices to make the most economical and effective use of the funds they already have.

This modest treatment of the potential use of the learning center in the 70's and beyond has been designed not so much to review or predict the technological developments which can measurely enrich the education of students. The emphases, I hope you will agree, has not been on hardware nor even much on innovative techniques, valuable as both are. As I said at the outset these matters which have been treated exhaustively elsewhere will also be discussed here by highly knowledgeable and experienced professionals. My aim has been primarily to relate some of the basic developments and changes in American society to desirable developments in the academic enterprise. These matters, I believe, ought to be considered especially by those who now have the power of decision as to whether or not a learning center should be established or its services expanded.

Again, any one who has read Toffler's *Future Shock*, even if he cannot accept some of the conclusions the author reaches after a prolonged and intensive analysis of our culture must be convinced that massive and basic change will be the immediate order of the day. Except the church, education is perhaps the most conservative institution in Western culture. Now, however, it can no longer escape the impact of the forces at work with accelerating speed in altering our personal and collective lives. Toffler also states a truth of social evolution that those intitutions which fail to meet the changing conditions of cultural life disappear. The learning center as a single agency will not suffice to adapt the enterprise of education to the swiftly emerging educational needs of a rapidly changing society, but its influence in some cases may tip the balance in favor of survival rather than dissolution. For these reasons I believe the learning center will be more widely adapted by the institutions of higher education in this decade and its effectiveness will, through research and evaluation, be steadily enhanced.

IS THE LEARNING CENTER CONCEPT VALID FOR EDUCATION IN THE SEVENTIES?

HAROLD B. GORES
President
Educational Facilities Laboratories

The subject before the house is, "Is The Learning Center Concept Valid For Education In The 1970's?"

Having thought about this matter, I think the answer is yes. Therefore, let me take the time allotted to me to describe the general setting and conditions in the 1970's during which learning centers will be built.

First, the economic situation today is nothing less than vivid, especially for private education. There is general agreement that the economic curve has bottomed out as of last November, heralded by the bottoming out of the stock market six months earlier as it always seems to do.

However, education seems to have a private economic curve of its own. If the pattern of the 1930's is to be repeated during this recession, we can expect education's curve not to turn upward until about 18 months later than the general economy. If this pattern repeats, I would expect 1971 to be worse financially than 1970, and it mav be well into 1972 before money in any sizeable quantities starts to flow again toward education. This optimistic prediction is based upon the assumption that our economy did indeed turn upward last November. A real pessimist might contend that today's conditions are more analogous to the year 1930, and not the year 1932. Being an incurable optimist personally, I like to believe that we have just gone through the modern version of 1932.

Only time will tell, but the kinds of things I am hearing these days are remindful of the early '30's--not so many weeks ago, the president of a small private college told me that his faculty, after examining the college's books, voted to take a 10% pay cut in order to help the college to pay the faculty for the month of June.

Because EFL's mission is to help schools and colleges with their physical problems, my remarks will focus mostly on buildings and equipment--the solids of education as distinguished from its gases, the curriculum.

Let's put the physical environment in perspective. A college is at least three things--people, ideas, and a place--in that order. Because the places of education are not as important as its people does not mean that environment is unimportant. Dr. Harry Johnson, Director of the famed Life Extension Institute, reports that from his study of the environment of office workers, the quality of environment makes about a 15% difference in their productivity. Now 15% is not a major fraction, but it is three times larger than what your friendly bank is giving you for interest on your money.

In fact, the building itself does not loom large in the total context of cost. Typically, a new building in education represents about 6% of the total cost over the life of the building to perform the function for which the building is built. It is not bricks that cost great sums of money, it is people.

If you are going to be building in the 1970's, here are some matters you should be sure to study:

1) *Building systems.* With building costs escalating at the rate of 1% a month compounded, we no longer can consume three or four years in planning and constructing a building. Once the decision is made to have a building, and its location has been determined, the planners should "fast track" the planning process. To illustrate, when the schools of Broward County, Florida, commissioned architects to design $16 million worth of schools, the architects had pre-bid over $5 million worth of the components going into these buildings. The pre-bids were sought one month after the architects were on the job.

2) *Systems buildings.* The handcrafted, stick-on-stick method of putting buildings together is incompatible with the industrial revolution. After World War II, British aircraft companies, seeking another product, went into the building of schools. Being aircraft manufacturers, they pre-engineered the components so that all the parts and pieces would exactly fit each other when assembled on the site. The principle and practice of building with pre-engineered components is now well established on this continent. It holds the best hope now at hand for stabilizing costs.

3) *Flexibility.* Whatever you build, make sure it is flexible so that your successors can alter interior space according to their needs. After all, a building built today will

only be at half life in the year 2000.

4) *Comfort and amenity.* In the last decade there has been a substantial shift in our culture with respect to institutional comfort. Our culture now feels less guilty about providing and paying for air conditioning and furnishings which are comfortable and beautiful. Indestructibility, antisepsis, and low maintenance are no longer the principal motifs of design. We have learned that we can trust the occupants and therefore everything doesn't have to be ceramic, plastic, metallic, or stone.

5) *Instructional technology.* When Thomas Edison was making moving picture machines, he declared that the American teacher could now be replaced--but it didn't work out that way. When radio came upon the scene it was to connect every crossroad school with the national dialogue--it didn't work out that way. When television came it was to be "the new window in the classroom." And then there was the teaching machine, and then computer-managed instruction, and then computer-assisted instruction. In the meantime, the pupil-teacher ratio has been dropping. The more help we give the teacher, the more teachers we seem to need.

In the meantime, the private sector has found the "ed biz" to be something less than a gold mine. For whatever it is worth, my observation is that those devices and services which supplement and extend the teacher will prosper, and those that ask the teacher to stand aside will wane. After ail. the teacher possesses the territory.

As education moves more and more toward the individual and away from the organized, scheduled lock-step group, hands-on, lap-held, portable, lightweight, battery-operated devices will flourish. A learning center that maximizes the capability of an institution to generate its own software is right on target for the 1970's. Capitalize on the cassette revolution and our increasing capability to copy materials quickly and inexpensively, both print and sound already, and soon the picture that moves. Be especially watchful of microforms and the general trend toward miniaturization.

6) *Warmth.* Education's symbol is the Lamp of Knowledge. Through the years schools and colleges have been concerned almost exclusively with enlightenment. Typically, they've been concerned more with the facts of the matter than the feelings; concerned more with motion than emotion; concerned more with orders than options.

At the turn of the century, G. Stanley Hall, a great psychologist of his day, said, "Intellect is but a speck on the sea of emotion." In the learning centers you will be planning, make sure that the media don't dominate the message, and that your personnel are first of all persons. Avoid where you can the mechanical chill that characterizes technology. A Spanish philosopher, Miguel De Unamuno, thinking of Goethe's dying word, "Light, light, more light," said it best when he declared passionately, "No, warmth, warmth, more warmth, for we die of cold, not of darkness. It is not the night that kills but the frost."

WHAT CORPORATE DONORS EXPECT OF EDUCATION IN THE SEVENTIES

WILLIAM F. MAY
Chairman and President
The American Can Company

Thank you for inviting me. I can say this honorably now, in light of the educational experience this conference has provided for me. In all candor, often in thinking about my remarks today I have been appalled at the presumption of a businessman who would tell professional educators what he expects from them in efficiency and effectiveness in the decade of the 70's. Yet this is what Dr. Baird has asked me to do, and to do it in full knowledge that educators have at least as good a track record in goal-setting and goal-achievement as business.

Perhaps I am made bolder by realizing that almost any educator worth his salt, or any of his students, would have no compunction whatsoever about describing in detail what he--and he would normally say--he and society expect from business over the next ten years.

As a matter of fact, the business executive and the college administrator have almost every problem in common. Each of us is a manager, for better or for worse, over the M's of modern management:

1. The management of money;
2. The management of men;
3. The management of machines;
4. The management of material;
5. The management of marketing.

The sixth M is our mutual concern for the human mind, its discovery, its nurture, and its fulfillment.

A concentrated analysis of the limited effectiveness of our management of money, men, machines, material and marketing--at least when compared to optimum effectiveness--is enough to make a strong man weep.

The world seems to be crashing down on educational and business executives. Human expectations of business and educational institutions seem to have no boundaries. Money is a prime factor in meeting these expectations, and the wherewithal with which to satisfy them is simply not available. In the case of educational institutions, whose income is derived --at least, in a large measure--from tuition income, the loss of students can be catastrophic.

I read last week of a private college in Georgia that normally at this time has 350 applications for entrance in the coming fall. This year, it has seven.

The time-honored art of grantsmanship has lost its charm and effectiveness in today's soft economy. For several years, elements from students and faculty alike have badgered the federal government for using universities and colleges in military research. Many of these programs are now withdrawn, and in some major universities, physics, chemistry, mathematics, and biological sciences have had their incomes cut as much as 50 per cent.

The catalog of bad news for educators is long, and you are more qualified to recite it than I am. I am reminded of an apocryphal briefing which the President is said to have sought from the Secretary of State on the conditions of world affairs.

It wasn't cheerful. The Mid-East was a powder keg. The Soviet Union had completed its nuclear submarine base in Cuba. Our former enemies and now strongest allies--Germany and Japan--were capturing U.S. markets, Indo-China was devouring our men and resources. And much more.

The President listened glumly, and finally asked: "Isn't there any good news?"

The Secretary of State fumbled through his pockets, finally producing a crumpled memo. "Oh, yes," he chirped brightly. "The Aswam Dam is leaking!"

I don't think you asked me here to go on a crying jag with you. So, let's put our handkerchiefs away, take a deep breath, and face the future together with courage.

Let me state a thesis for your consideration. It is our mutual objective to bring optimum levels of professional skills to the management of money, men, materials, and marketing to the end that our joint services provide a total environment hospitable to the human mind, and to the attainment of human aspirations.

As a businessman, I honestly believe that the Seventies will see our system of higher education develop new and lasting strengths, new stability, new productivity toward human goals. It won't happen without immensely increased understanding and cooperation among three sectors: Education itself, industry, and government. We all inhabit the same boat; if one end sinks, the other end won't stay afloat for long.

I believe that the ship itself will survive, with its crew, and sail on to new and exciting frontiers.

One major trend is clearly visible today and that is the demand for better management in every area. This demand is great, growing and worldwide. It affects not only business but government, education, and all other human enterprises and institutions. This conference today is living testimony to the search for better management.

To appreciate the force of this trend, it is necessary to recognize the changed, and changing, concepts which govern our view of management and its meaning. In earlier times, it was enough to say that the purpose of corporate management was the economical and efficient handling of money, men, machines, materials, and markets. The measurement of management's success was, very simply, profitability. Still essentially correct, these concepts are just the basic building blocks in the complex structure which we call the American economy today.

Winston Churchill once said: "It is a socialistic idea that making profits is a vice. I consider the real vice is making losses." This will forever remain true, if only because an addiction to red ink on the part of managers is a vice not freely forgiven by stockholders.

Most of us today, however, realize that there is a larger and better reason for profitability. It lies in the fact that the earnings of industry generate most of the wealth and the tax revenues which sustain and expand our public services--in government, education, health, recreation, the arts, and all the other components of a true civilization.

Both in quantity and quality, therefore, society's services to the citizen depend in large part on the efficiency and effectiveness with which our business enterprises are conducted. This is the new meaning of business management today. Better methods, systems, organization, and equipment are the tools. Innovation, sharpened by invention and spurred by competition, is the driving force. Increased productivity--the one real antidote to poverty--is the end result. The title you have assigned to me indicates your understanding that criteria for the private sector are deeply relevant to education.

None of this is to pretend for a moment that we have reached, or even approached, the pinnacle of performance. No system is any more perfect than the human--and therefore fallible--beings who man its controls. Nevertheless, American business management, with all its faults and all its failures, is one of the hopes of this world. Underprivileged nations cry aloud for its guidance and expertise. The more advanced economies profit from their association with it, much as they sometimes decry the "brain drain" it is said to create.

But now, having extolled the achievements of our economy, let me hasten to acknowledge its limitations. In a nation and a world hungering for material and social progress, we seem unable to keep up with the demand. This condition affects your institutions adversely, as it does the human condition itself.

Claimants to our gains in productivity are numerous and insistent and some of them are new. Education is only one. The cities, caught in the grip of urban crisis, are calling loudly for help from the states, the federal government, the business community, or any other possible source of assistance.

The complex of problems centered under the heading of "Ecology" has developed an urgent and vociferous public demand for prompt and vigorous attention. And, speaking for a corporation whose products and processes are deeply involved in environmental problems, let me say that business is keenly aware of its obligation to join heartily in the search for solutions. The new National Center for Solid Waste Disposal is among the foremost concerns of my company today.

Recycling is now an in-word. Let's look at it for a moment. Recycling is itself a matter of technology and the application of management skills. Louis Armstrong became famous in part by singing: "Everybody talks about Heaven ain't a-goin' there." Very few who talk knowledgeably about recycling have the foggiest notion what it entails in men, money, machines, materials, and marketing. Yet recycling is a social goal, and business and government simply must respond.

The need for innovation and improvement in the management of government was recognized by President Nixon in his State of the Union message where he outlined a sweeping organization plan for the federal establishment. The states, the counties and the cities face acute fiscal distress--but many of them suffer just as much from lack of organization, duplication and delay as they do from swelling budgets and shrinking incomes. So do we all.

It comes down to this, I think: When an institution, private or public, encounters a ceiling on its revenues while its costs--through circumstances beyond its control--increase, then that institution must look for solutions within its span of management control. This need not mean retrenchment in terms of personnel employed and services rendered. It does mean an earnest search for more efficient and effective ways of creating marketing and delivering its services.

It is always tempting at this stage of a speech to embark on a "Gee Whiz" prophecy of conditions as they will exist in the year 2000, or even in 1975. The basic fact of the matter is, however, that both business and educational leaders today have some difficulty in predicting accurately what is going to happen in the next quarter or next semester. Then, there is always the possibility that our predictions may simply omit the most important developments.

In 1953, for example, on the 50th anniversary of the Wright Brothers' first flight, some of the nation's foremost aeronautical engineers were asked by a scientific periodical to review the first half-century of aviation and look ahead into the next fifty years. The experts devoted themselves entirely to discussion of technical changes in existing aircraft, along with some speculation on the possibility of supersonic flight, but there was not a single mention of the exploration of outer space, and four years later Sputnik I went into orbit.

In 1960 a Presidential Commission published a report entitled "Goals for Americans--Programs for Action in the Sixties." Many of the Commission's findings were sound, well-reasoned and imaginative. In the field of higher education, for example, the report set goals which we are yet to reach.

Its analysis of the financial problems of colleges and universities was acute, farsighted, and pertinent today.

But that report is also interesting because of some of the changes it did not anticipate. Some of you may have seen a recent cartoon in which a middleaged gentleman is saying to a friend: "Confused? Of course, I'm confused. I have a son at Vassar and a daughter at Yale!"

No 1960 Commission could possibly have visualized the long hair, whiskers, blue jeans, rock festivals, freakouts, teach-ins, sit-ins, and all the disruptions which last year led to a Presidential Commission on Campus Disorders.

The fact is that I don't have to venture too far into the realm of prophecy in describing what we may expect from education in efficiency and effectiveness in the Seventies.

We have already agreed that the management of money is one of our joint responsibilities.

When money is tight--and we should never assume that it is loose--there are two methods of utilizing money more effectively:

1. Make greater use of existing facilities;
2. Expand the market for what you have to sell.

Your host institution today is a front-runner in the use of new technologies. It is famous far beyond Oklahoma for its use of recording tapes to extend the effectiveness of its teaching staff.

About two weeks ago I sat with the Dartmouth Overseers and heard its new president, John Kemeny, discuss Dartmouth's proposed complex schedule of term sessions with its increased use of facilities, and its more effective use of faculty talent on a year around basis to allow the student to obtain his undergraduate degree in 3½ years and, at the same time, provide the student with the opportunity to spend two six month periods on his own learning projects or in work outside Dartmouth. This experience gives him an opportunity to establish his life values, based on non-academic realities as part of his intellectual development.

Certainly the whole field of adult education will become at least as important, and perhaps more so, to the institutions you represent than the undergraduate training. I would suggest that the rapid obsolescence of knowledge is perhaps your greatest challenge. I think that you should ask business and industry to be your partners in overcoming this obsolescence.

When Francis Keppel was U.S. Commissioner of Education, he pointed out that industry alone is spending something in the order of $17 billion annually for educating its employees. One does not have to look into the distant future to see how closed-circuit television can be the medium for transmitting the skills and abilities of the academician to millions of workers as well as a means for sharing business-gained experience with the students on campus. We, and other firms in the Chicago area, are working on such a program now with Illinois Institute of Technology.

I have already mentioned recycling as it affects the general industry I represent. But I suggest that there is another form of recycling that offers market expansion opportunities to your managements: This recycling of students, whatever their age. Incidentally, I just read that in Maryland, two women legislators have introduced bills to make marriages good for only three years. In other words, to recycle marriage. Rest assured, I am taking no position on that issue.

But recycling the intellect is another matter. Scholars say increasingly that in today's pace of change, advanced degrees should be renewed at least each seven years. I see no valid reason why your facilities of brick, mortar, and talent shouldn't be used around the clock in recycling students, why your institutions shouldn't be the very heart of a perpetual intellectual and spiritual refreshment of the mind. If colleges and learning centers--using new communication techniques--don't rise to this challenge, other institutions will. It might even be business.

The extent of the college role in this recycling of the mind depends in large part on your own increased management innovation in extending both your products and your markets.

Please do not count me among those who entertain the comfortable assumption that all the colleges have to do is to install "business methods" of management and their financial woes will disappear into the night. But I do agree with Harold M. Williams, the new Dean of the Graduate School of Business Administration of the University of California at Los Angeles, who says: "The drying up of funds will put pressure on our public institutions to be much more businesslike and efficient." As a former Board Chairman of Norton Simon, Inc., Dr. Williams knows both sides of this particular table.

Dr. J. Douglas Brown, former Dean of Faculty at Princeton, supplements Dean Williams by saying:

> "In the administration of a soap factory, the absence of a sense of economy soon results in bankruptcy. Profits and losses are obvious to an investor. In the administration of a college or university, the absence of a sense of economy can be camouflaged for years by low salaries, poor instruction, and wasted effort . . . yet, universities and colleges deal with the most precious resources a nation can possess--talented teacher-scholars and the potential leadership of future decades."

Dr. Douglas continues:

> "Even though a wealthy country can affordto waste money on badly-managed soap factories, it cannot long afford badly-managed colleges. With the pressures now placed upon higher education to help the nation provide the talent and knowledge to adjust to dynamic change, it is high time that every effort be made to improve the management of every institution."

In recent months, this issue has been given major scrutiny throughout the country in the councils of some fourteen organizations concerned with the financial support of higher education. This is a heartening development for it brings educators and their business allies together in the analysis of their mutual hopes and expectations.

At this point, I wish to disavow any thought that corporate donors have a "right" to "expect" anything from the colleges. Since they contribute only about two percent of higher education's total costs, the corporations are sitting in the bleacher seats far beyond left field. But corporate contributions committees will give three cheers for every program designed to improve efficiency in college operations, again providing you communicate and market them.

When we speak of efficiency, we are obviously talking about much more than counting the spoons in the cafeteria or installing meters in the parking lot. When we get to the heart of the problem of good management, we have to talk about the more effective utilization of our human resources--the skills, talents and experience of qualified people. It is on such questions as this that college administrators will find ready listeners and staunch supporters among their friends in the world of business.

A study found wide variations in the ratio of administrative staff to enrollment. In a detailed comparison of two colleges, it was found that both had enrollments of about the same size, both were about equally well-regarded, both enrolled about the same number of freshmen--and both wound up with about the same deficit. Yet one had an administrative staff nearly twice the size of the other. Here, surely is a field for fruitful inquiry!

What I am urging, really, is closer communications between education and industry through mutual concern over matters in which one is expert and the other is not. If educators enlist the help of businessmen in solving their management problems, the businessmen will learn more about education. If educators accept the principle of accountability in managing their mundane affairs, they will find businessmen much more appreciative of their productivity in the realm of the relatively intangible, the realm of the mind.

Creative citizens, leaders, energizers--these are what the nation, not necessarily the business community, should expect of education in the 70's. People who can initiate meaningful change without being blown off course by the winds of aimless change--these are the people we will need at the command posts of all of our institutions. We look to education to produce such people and we know, from the very beginning, that there can be no real reckoning, in dollars and cents, of the costs or the results.

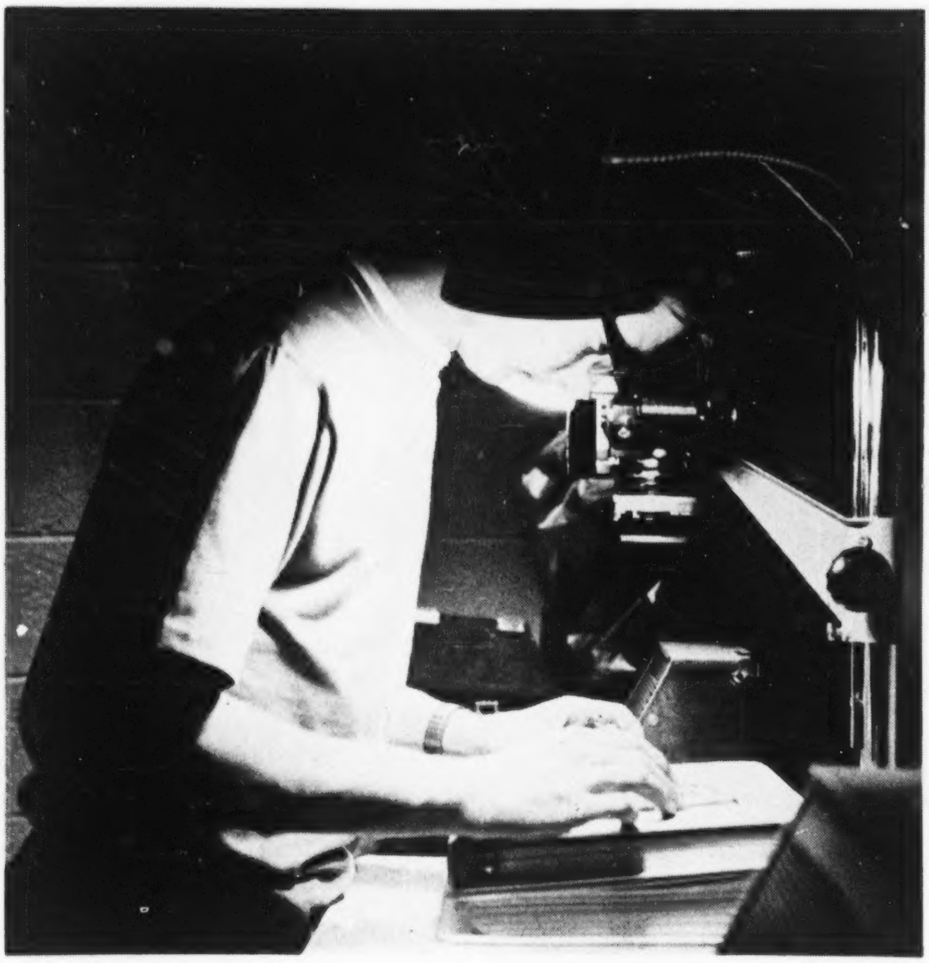
This, then, is a matter of faith. America is the scene of the greatest experiment in mass education in human history. We are all committed to the belief that the doors of opportunity must be kept wide open. In this process, corporate donors must take their chances. We can, and we do, try to relate our support to our enlightened self-interest--through scholarships, research and other such programs. It is not so very long, after all, since it was believed that the law would frown on corporate support of even the most worthy of charitable and educational causes.

For the future, I, for one, believe that business must increase its contributions to higher education as one sure way of insuring the general progress of society. But I also believe that a stronger partnership between education and business will strengthen both institutions. Both business and educational institutions are constantly on trial. Neither is static nor permanent. If either fails in its mission, society will find ways of replacing it.

Let us hope, in short, that they take to heart the words of Alfred North Whitehead who said: "A great society is one in which its men of business think greatly of their function." I would modify the words of the noble philosopher by saying that a great society is one in which its men of business and education think greatly of their functions and use effectively all the resources with which they are endowed.

I'll conclude with the words of Dr. Dale R. Corson, spoken after one week as Cornell's president:

> "Innovations must be weighed and tested, but innovation there must be.
>
> "If there are any of you who believe that the future can be assured through business as usual; who believe that the ways of the past will suffice for the future; who believe that present institutions unmodified can serve the future adequately, I must tell you that your view is short and your understanding meager. If we are to survive we must have vision. We must have courage. We must be willing to change. And we must realize that the time is short.
>
> "Let us get on with the task."



INTEGRATING LEARNING CENTERS INTO THE CURRICULUM

WESLEY C. MEIERHENRY
University of Nebraska

As a way of integrating the learning centers in to the curriculum, several alternatives were presented. They were as follows:

(1) Install the technology and then try to find the ways of getting the staff to become interested in utilizing it. This particular approach suggests that it is better to start with the technology which then places pressure on the faculty to make use of the hardware which has been installed.

(2) The second approach is to work with the faculty in reconceptualizing their courses and the program. This particular alternative suggests that if the faculty does the careful planning they will eventually arrive at a point where they see the necessity for installing technological systems.

(3) A third strategy is to develop instructional media centers but to place them as close to the faculty as possible. This particular alternative suggests that the faculty is more likely to use technology if it is readily available and accessible and if its resources are related directly to their content field.

(4) Another strategy is to purchase commercial materials to be used in the instructional program and then to move from the commercially prepared materials to locally prepared materials or as a minimum the adaptation of the commercially prepared materials. This particular strategy suggests that the faculty needs to have some idea as to what technology can do for them before they will begin to utilize and produce their own.

(5) Another plan is to raise the basic question with the faculty as to what learning really means in college level learners. This particular approach goes beyond No. 2 above in that it suggests that basic question of learning and instruction be approached which ultimately will lead to decisions about utilizing hardware and software.

Some types of institutions are better able to promote discussion of teaching and learning than others. For example, the community college at the present time is dedicated to the sole objective of teaching and learning. Therefore, in the Junior College setting it is generally easier to get the faculty interested in the utilization of technology in their courses. Small private colleges are also dedicated to the idea of learning although they sometimes view their student bodies as being more interested in a classical approach to education. The large multi-universities, because of the very nature of their program and the types of staffs which they have, must devote major efforts to the idea of improving instruction if it is to take place.

The type of individual who is responsible for the learning center also has much to do with its utilization and development. Increasingly, educational institutions are looking for individuals who are knowledgeable about both print and nonprint fields. Most training programs do not include these two areas sufficiently so that there are problems in locating appropriate staff to serve the variety of roles required by the learning center. It is evident that the training problem is one of the major stumbling blocks to the more rapid development of learning centers in all types of educational institutions.

Along with the training program is the problem of certification at the elementary and secondary levels. A number of states are now moving to the development of certification requirements for the media or learning center specialist. Such certification requirements should go beyond the traditional courses in either library and/or audiovisual but should include an integrated approach of all learning resources. Certification and accreditation procedures must receive attention if the schools are to move to the development of media programs.

A number of institutions are reporting successful programs to get the faculty involved in the use of technology and the improvement of their own instruction. For example, one or more institutions are making use of a short workshop for the faculty usually held at a retreat some distance from the campus. In these workshops, attention is given to such matters as the writing of behavioral objectives, spelling out of instructional procedures, sequencing of instruction, development of media as a part of the instructional scheme, and developing new and better ways of evaluating the performance of the students. Other institutions are experimenting with fellowship programs whereby faculty members are released for a period of time to improve their own courses. Other institutions are encouraging faculty members to participate in institutes of various kinds in which attention is given to the improvement of instruction.

Thus, the integration of learning centers into the curriculum is a difficult and continuing task. There are, however, a number of strategies by which the faculty may become involved in the application of technology to their courses. The training and assignment of appropriate persons to work in the learning centers is also an issue to which attention needs to be given. Certification and accreditation also need updating to incorporate what is now known about instruction and learning. Finally, there are ways in which institutions can encourage their faculty members to actively participate in the improvement of instruction including the use of media in their courses.

EVALUATION OF LEARNING CENTERS

STAFFORD NORTH
Dean of the College
Oklahoma Christian College

This session is about evaluation of learning centers -- an area that no one seems to know very much about, so I'm hoping some of you will have had some experiences in evaluating learning centers that you can share with us. As a beginning point I'd like to set a framework for our discussion which follows the chart that I have distributed to you.

Variable	Effect	Population	Measure
Method	Learning Outcome	Individuals	Standardized Test
Materials	Attitudes	Course	Local Comparison of Subjects
Arrangement	Usage	School	Percentage Achieving Objective

First of all, in considering the evaluation of learning centers, there are, perhaps, three categories of variables we should consider. The first variable is *method*, that is evaluating video tapes, audio tapes, cassette tapes, single concept films, programmed instruction or some other teaching method we wish to investigate, Another variable is *materials*, an attempt to compare two different materials presented by the same method. Thus you might compare one audio tape program with another one or one film with another to determine which of the two is more effective. A third variable is *arrangement;* that is, the use of carrels as compared with other places of study, large class instruction as opposed to small class instruction, or individually paced instruction as compared with group paced instruction. I am sure there are some other categories we could add, but at least these will illustrate some ways of approaching evaluation.

Next we are interested in *effects* which also fall into three categories. The first is *learning outcome;* that is, do students learn more, do they learn less, or is there no significant difference? The second category of effects we might call *attitudes*. Do students like a method better, or do they not like it as well? Do teachers like it better? What does the faculty think about video tape, audio tape, concept projectors, independent study? Likes, dislikes, preferences, opinions--all these involve attitudes and these are an important element in evaluation.

A third category of effects is *usage*. How much are methods or materials used? How many hours a day do students spend in their carrels? Since each student has his own carrel here at OCC, have there been any effects on library usage? All these are matters of usage.

Next we might consider how the *population* is arranged? Are they individuals, groups in courses, or is the study school-wide? Many times, for example, when we try to compare methods, we compare them within a course structure by having one section use a certain method while a different section uses another. Often we may not get a valid outcome because the student knows that the course grade is going on his record and will follow him forever, regardless of what the method has been. So, if he did not learn the material by video tape, and somebody else is using programmed instruction, the video-student may be getting with him because he has to learn it. While I'm not saying that we never want to compare matters in a course context, I think there are some disadvantages to it. For some studies, at least, I believe it is useful to compare by using subjects who are outside a course context. As indicated on the chart, this approach would be individual rather than within a course.

Then, of course, there are school-wide measures which indicate effects on the whole campus, the whole community.

Now let us look at three categories of *measures.* The first is *standardized tests:* Graduate Record Exam, CUES, ACT scores, A standardized measure, for example might compare the learning outcome in a particular subject area with students elsewhere on the basis of national norms. Another measure is *local comparison* of students; that is, we may set up an experimental and a control group and make comparisons in our own local situation rather than on any national norms.

The third type of measure does not involve comparisons at all in its basic form. Rather, it simply asks what *percentage of your students* are achieving your objectives? How many students will the method, materials, or arrangement get to the objectives which you've set? Will it get 30% of the students to 50% of the objectives, or will 90% of the students achieve 90% of the objectives? Dr. McGrath, in his presentation this morning, quoted a study which said that if we allow enough time, 95% of the students should be able to make an A. What he is saying basically is that 95% of the students could achieve 90% of the objectives in a course. Now this type of measure does not prove that that one method is better than another since most of us have not been measuring this way in our conventional instruction thus providing no basis for comparison. At least by this approach, however, we can demonstrate that some method does the job and that is certainly a good step forward. Once a base of information is established on some approach, then another method could be compared at a later time.

So we may think of these general categories of measuring: standardized tests, local comparisons, and a percentage of those achieving the objectives.

Now let me mention a study or two we have done at OCC to illustrate these points. In 1965 we compared ways of teaching speech in our beginning speech course. On the chart, we are dealing with a *course*, with *learning outcome* and we had a particular *method* to test. We had one group of students (two sections of the course) in which students met in the traditional fashion, three class meetings a week with a teacher. Another group (also two other sections) had two class meetings a week with a teacher instead of three and in place of the third, they listened to an audio tape. This plan reduced teacher time by 50 percent. We gave pre-tests and post-tests, both for theory of public speaking and also on speaking performance. Outside observers graded the speeches at the first and at the last. There was no significant difference in the learning outcomes, but there was a considerable saving of teacher time. In terms of attitudes, however, the students who had the two class meetings a week with the tape were asked, "Would you rather have had this plan, or do you wish you had had three class meetings a week with the teacher?" The students by an 8 to 1 margin said, "We prefer the two class meetings a week and one tape."

Another study which we call "Impact Study" was concluded in September of 1967. This was a study of attitudes and usage of the learning center -- attitudes and usage. We were not trying to measure learning outcome. We were also studying the *arrangement* of having a learning center with carrels as compared with the study arrangement before we had the learning center. We gathered certain data for three semesters before the Learning Center opened. During this time we surveyed the students to find, for example, that their estimate of how many hours a week they studied was fifteen hours. We also found that 60 percent of them said they did most of their study in their dormitory rooms. Library usage for those three terms was also calculated. We gave the CUES (College and Universities Environment Scale). Then, the Learning Center opened, and we gathered data for three more semesters. This gave a basis of comparing *attitudes* and *usage*, before and after. You can see, of course, the problems of trying to do something of this type on a school wide basis. You cannot set up the typical control group experiment--you cannot mark half the students with "X" and say to them, "You cannot go into the learning center." And you cannot allow half of the teachers to use the Learning Center and forbid the other half.

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question to answer--It's difficult for many reasons. For one thing, it's hard to isolate all the factors so that, even if the students are learning more, you can say what caused it. That's why, personally, I think the best way to establish a learning outcome--whether you're studying a method or materials or some arrangement--is to do it outside of a course context by taking some students off by themselves, giving them a test and then letting them use the plan to be tested, and then measuring them again. This is often difficult to do because it involves extra money and extra time.

There are, of course, some ways of getting at learning outcome in a general way but these must be recognized as being far from absolute. For example, standardized tests. We have GRE scores on our graduates over four or five years before the Learning Center opened and for four or five years after. What do those show? Well, there is a gradually increasing score on the Graduate Record Exam. What does that prove? Our ACT scores on our entering students show not much change--it's a fairly straight line and the GRE score is an increasing line. So we say that is a straw in the wind. It says, at least, we are not hurting students with the new things we are trying and maybe it is a little indication that these are doing some good. We have taken some measures in individual classes. For example, look on the chart at the one involving a *percentage* achieving an objective. Our orientation course for freshmen was formally graded on the curve. Now we have fifteen objectives and we say that a student who wants an A must do seven of those objectives that are required and at least six of the remaining eight. Now about 85 percent of the students in the course make an A. I personally do not believe we should say to those students at the outset, "Now here are the objectives we want you to achieve, but we want to tell you at the start, that not but 10 percent of you can make an A." If we can set up the standards that are reasonable and 85 percent of them want to reach them, why should we keep them from doing it? While we cannot prove that the students in this course are learning more than if we taught it some other way, at least we can say that 85 percent of them are reaching the objectives, and that is of considerable importance. Determining the percentage achieving the objective, then, can be a useful measure.

We do the same thing in the area of freshman English. We start our students in freshman composition with a one-hour step, English 111, and we say that this step means you can write as described in a set of behavioral objectives. We say to the student, if you can write as well as this standard suggests on an initial paper, you get the one-hour credit and go on to the next step which happens to be the research paper, another one hour step. If on the other hand, his first paper shows that he is weak in punctuation, paragraphing, or organization, then there are certain lessons that are prepared for him according to what he needs. There are twenty-four lessons in all, but most students don't need all twenty-four of them. They are directed to what they need. An advanced English student meets with each student once a week to tutor him, to go over his paper with him. He also meets with a teacher once a week in a large group and hears about one tape a week. He stays in the program as long as necessary to get him to write as well as the objectives suggest. If, at the end of the first trimester, the student cannot write that well, but he has made an effort, then we give him a W and he re-enrolls in the course the next term and starts wherever he was.

As soon as he has achieved the objectives, he gets credit for it. The reason we give him a W and let him re-enroll is that if it takes them longer than one term to finish, we think he ought to pay for it twice, because it costs us more. If, on the other hand, after one term he has not reached the objectives, he gets a W so that if he transfers, he does not have an F on his record. If he has made little or no effort, however, we give him an F. We are getting about 80 percent of our students through this first phase of writing during the first trimester.

We have measured this program in several ways. We compare results on the Junior level English Placement Test of the students who have come through this program as opposed to those who have transferred here. We find that a higher percentage of transfers fail the English Placement Test than do students who go through our program. We think that says a little bit, a straw in the wind again. We have also taken some of our papers to determine how well our teachers compare on grading with others. These are some attempts, again, to determine the learning outcome, and particularly in terms of the percentage achieving a given objective.

Now, do you have some experiences in evaluating your learning center or courses on your campus that you can share with us, or do you have some questions you would like to raise?

Question: How does your cost of operating with the learning center compare with the cost if you did not have it?

I can't tell you in dollars and cents, but I can tell you that OCC has the lowest faculty investment per student-credit-hour for the lower division is where we make the greatest use of our learning center. Before, for example, we had twenty-five students in a speech class which met three times a week. Now that course meets only twice a week with other materials in the learning center. This means that a teacher can handle 60 percent more students.

Question: What are the cost figures on the English composition course you mentioned?

In a study the Academy for Educational Development did for us, published in September of '70, they analyzed this particular English course. What they called English 111 with media assist (the way we teach it), had a rating of .145. Now that is not 14.5 cents, it is just .145. If the same thing had been done without tapes and other media, if it all had been done with the physical presence of the teacher, it would have rated .336. Another comparison was made in taking English 114, which is the next course, with the media program that we used with it, comparing it with the plan we formally used. The comparison was .204 with .699. So again, about one-third the cost. Of course I'm speaking here of operational costs only and not the initial cost of any hardware.

Question: What type of materials do you have on the tapes?

The tapes we use are not usually just recorded class sessions to allow the student to re-listen to what happened in class. We do that only occasionally. Some colleges make a big use of recording class sessions, but we feel that to record a classroom experience and then let someone who missed it listen is not really too useful. For example, what we are doing now is interacting with each other. You are asking questions and the physical presence of the student is worth something. This opportunity is not very well recaptured by tape. For some special occasions, however, it can have some value.

What we do on tape, rather is to provide certain materials that lend themselves to that type of instruction certain organized presentations, certain problem-solving experiences and the teacher prepares a recording that is designed just as a recording, not as a recorded lecture. The student has the worksheet developed for use while he listens to the tape, and the worksheet gives him charts, graphs, maps. If I were preparing something along the line of our discussion on evaluation for example, I would include the chart I have shown you on the worksheet, leave room for writing, and put blanks to fill in and space for notetaking. Sometimes the worksheets have photographs or maps or, occasionally, a true-false test or something to which the student responds while there is a silent period on the tape and then the tape comes on again and says "you should have marked this one true and here's why and this one false and here's why." So it is a kind of a programmed experience, not just a recorded lecture.

As another example, one of the speech tapes I mentioned earlier is on how to organize a speech. Well, in that recording, a speech outline is shown and the tape discusses that outline, what is good about it and what is bad about it. In another exercise the student is given a few statements on the worksheet and is told, "Now, during the next five minutes of silence on the tape, you put these in the right order to show clear organization. Locate the main points and what goes under them." So the tapes are often a "work out," laboratory experience, not just sitting and listening to a lecture. The teacher selects the experiences which are especially suited to this format and puts them on tape. The experiences he believes are best presented in class with interaction, on the other hand, he will present that way. There are things that may be better presented in print than either by tape or lecture. So the teacher makes his choice of media based on his judgment about which medium will do it the best.

Sometimes these media are overlapping. For example, I was teaching a class and had about a ten page handout that parallelled the class lecture. With some groups I have handed it out, and with others I have not. I have now concluded from questions and performance that it works better if they have the article to read as well as the opportunity to hear the lecture. Some other things in that class are done by recorded experiences. We have some tapes, for example that I have prepared on how to write instructional objectives. I think that those tapes do a better job than I was doing trying to tell it to them in class, because they have to concentrate a little more and it leads them through some steps in a very logical sequence.

I sometimes list six categories of ways to use tapes. One is just *recorded information.* This might be a lecture or maybe you are recording what is going on here and you take it back and play it to a class. That is just recorded information. A second category would be *drill,* like shorthand, or a foreign language. Another category would be the *semi-programmed* material that I've been describing. Another might be *resources,* like music or famous speeches or historical events. Another category would be *discovery* or *problem solving* experiences. Let's suppose that you are a teacher of oral interpretation and you have the recording of a poem by three different readers and you ask your students to analyze the difference between those three styles of reading. Or you teach counseling and you have a recorded counseling session, and you say to the students, "We have talked about some techniques of counseling. Now you listen to this recording, see if you can identify some of the techniques used or not used that should have been." So that is an experience which is truly problem solving. The sixth type is *audio tutorial* tapes in which the teacher leads the student step by step through a laboratory or other experience. The key word in these tapes in "pick up" or "get up and go to . . ." The teacher converses on tape using objects and materials for reference.

Question: How much do you estimate this kind of program saves in teacher time?

Well, this is going to vary widely, depending on the design of the program. We do not tell our teachers, "You go into this trying to save everything you can." We do tell them to go into it in a way that hopefully will result in some savings. We hope that some of the time they save from lectures or elsewhere will be spent in more individual contact with students. In the English Program, for example, we had no built-in one-to-one contact with students at all, so with some of what we save in that course we have now built in that kind of contact. Some of the saving we use to reduce faculty costs.

There is, then, no way to say specifically how much is saved. Theoretically, I suppose, you could design the program to save whatever you want to. You could design it so that there was no contact with the teacher at all. I think you would lose a lot if you did and our experience is that students, by and large, have to have some structured contact with teachers in order to keep going. For example, we do not offer intermediate algebra anymore in our college program. Sometimes we have students who need it. We found a programmed book on intermediate algebra. It has been tested and demonstrated that one can learn it. So we said, "That's the answer. A student comes in and wants intermediate algebra, here is the book, come back when you are through and we will give you a test." Of course you know what happened; he never came back. So now we set it up so that an advanced student, a senior math major, meets with that half dozen students once a week and says, "How are you doing? How is it going? What kind of problems are you having?" And now it works fine. The reinforcement they get by the class meeting, the opportunity to ask questions, and the necessity of getting certain work done in smaller units all combine to make this more successful. The student did not have enough initiative, enough discipline to go through the whole thing by himself and this experience has been repeated many places. You can "mediate" a program, if you want to use that term, to the point that students can do some things without the teacher entirely, but we found that really does not work very well.

Question: Do better students or poorer students make more use of the learning center?

Well, we thought we were going to come up with something that would really be great in this three semester study. The first two semesters after we started the learning center, we were checking the amount of time spent in the carrel and we had a randomly selected group of fifty students. For two semesters, we had the perfect correlation between how much time they spent in the carrel and what their grades were and the third semester came along, however, and changed the picture considerably. So which semester do you want me to tell you about? My judgment still is that the better students can do more on their own than the poor students--just providing flexibility for the poor student so "he can hear it over again," is not enough. He does not do it unless there is something that makes him. You have to provide more than the opportunity, in other words. Why is he behind? He was not motivated in high school, and he gets in college and we say to him, "Now if you do not understand the first time through, you can listen to that tape ten times. But is he going to do it? I do not think he will, unless there's something that makes him keep going. That is why in the freshman English Program, we have students meet with their tutors once a week. Once a week, they have to report. We keep a record of whether they show up or not. So we have a law around here that we call North's First Law: "You do what you have to." We find that the majority of students do what they have to and not much more. So when you build in the flexibility, you should build in the "have to" because if you do not, many students will not use the material. Perhaps we will find ways to improve on this and perhaps when more elementary and high school programs allow greater flexibility, the students will come to us with a different conditioning.

Question: Can rate be a variable in terms of the student learning?

Well, I personally favor this. I think we ought to allow students longer time, especially at some of the beginning levels. Now once they have gone through the two courses in calculus, for example, then there may not be the need for variation in rate that existed at the beginning where students come to you with widely differing backgrounds. But even at advanced levels, I am sure it could be used well.

In order to make rate a variable, of course, you have to provide some experiences in other than group situations, because if everything is tied into the group situation, then there is not a sufficient opportunity for flexibility. The teacher cannot give last week's lecture this week and next week, and the week after. So to provide the flexibility, you have to use something other than group meetings and here is where various media can be very useful. A tape recording for example, can be played any week the student needs it. A film can be shown any week he needs it, a book can be read any week he needs it, programmed instruction can be used any time he needs it, a teacher or a tutor can be available to talk at whatever point he is in the program. So to provide the necessary flexibility, you need some experiences that take out the lock-step that is built around the lecture. This does not mean if you are going to have much adaptability you have to have some other experiences. In the course in orientation that I talked of earlier, for example, there are about three or four lectures that students have to have to get the material. But the class meetings that occur after that are done to keep them moving, and they can finish at any point along the line through what they have in print or on tape. If every lecture were essential to his finishing, then a student could not finish early.

Question: What reward is there to the student who finishes early?

He has the satisfaction of having that segment completed and may proceed to something else. We do not reward rate in terms of giving a high grade.

Question: How do you provide time for teachers to develop materials?

We have developed most of what we now have on release time. We've received some funds from outside sources that have allowed us to do this mainly in the summer months.

Question: How do you figure teacher-load on the new program?

We take each course and study it individually with the teacher or with the department head to determine how much credit it should give. In other words, we no longer assume that every three hour course is three hours in the teacher's load. He may get one hour credit for a three hour course or, theoretically, he could get four hour credit for a three hour course, depending on the course and the nature of it and the kind of involvement that he has. Now normally, we try to design it so that he gets less credit than it gives credit hours to have some saving. But we negotiate this in each case, depending on the nature of the work the teacher has to do.

BUILDING DESIGN FOR LEARNING CENTERS

TOM GLOVER
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It is a mistake for clients to think that being creative is the prerogative of the architect. To me, a really creative building is one that embodies a creative concept in that the building allows us to perform a task we have done before; but in a new, more efficient and exciting way. Not just different for the sake of being unique, but conceptually different because it allows us to do a better job. Architects can be creative in building more efficiently. They can be creative in establishing significant and beneficial spatial and functional relationships within the building. Architects can be creative in their selection of construction materials and techniques; and they can be creative in establishing a mood within the building appropriate to its use. But, all of this really isn't enough. Without a creative client, all of this is just superficial background music without any real significance in regard to the main objective; which is a creative conceptual idea which gives it all a purpose and significance. To do creative work, architects need to be challenged and inspired by their clients. They need to have clients who are willing to explore and test new ways of doing a job and have the imagination and courage to accept new ideas. At times, this can be a painful and exhausting process which requires a great deal of determination. The architect and client *both* have to be willing to pay the price required to achieve this if the objective is to result in a significantly creative building. Neither one can do it alone.

Aside from the technical skills and aesthetic abilities you should expect an architect to have, he needs to have the ability to understand and respond to your requirements, ideas and needs. You need to be able to verbalize these objectives and be forthright, receptive and critical toward his solutions and alternatives.

It is important for the institution to have a committee which is continuous all the way through the planning. This committee should work with those on campus who will use the buildings as well as the architect. Audiovisual people should also be involved so that their needs can be taken care of during the planning stages. A special relationship should develop between those at the institution and the architect in which there is harmony and mutual respect and trust in each other.

We think that establishing this type of relationship between our people and the client is the first thing that needs to be done on any new job. The goals and objectives need to be defined; the relationship between our people and the client need to be established, and the responsibilities of all team members clearly understood. These people, all working together, have the best opportunity to formulate a really significant and creative conceptual way to design the project--not by the architect alone or not by a rigid and inflexible client.

It is unlikely that the client has participated in a venture as I have described, so it is the architect's first responsibility to develop this type of relationship and assist the client in understanding why it is important that he and the architect work together in this way. To be realistic, I have to admit that few clients and architects are willing to work this way, because it takes more time by both parties, and the demands imposed require complete dedication by all concerned. This process has varying degrees of success dependent primarily on the degree of determination by the architect and client. When it works as it should, it is a memorable and satisfying experience for both the architect and the client.

As architects, we feel fortunate in having had the opportunity to work with the people at Oklahoma Christian College because, in our opinion, here, it did work. The buildings that we did together are not particularly spectacular, but they do embody a really solid and significant creative concept. They are fulfilling their intended purpose, they are doing something done before but in a new and creative way, and they were built very economically and within the client's budget. We think of the buildings here as dynamic organisms in which the structure, the equipment, books, staff and students all mesh together in harmony to fulfill the educational goals of Oklahoma Christian College. The way students are educated here in Oklahoma Christian College is unique, and their method of doing this, in our opinion, represents a really significant and creative educational concept. As architects, it was our responsibility to respond to this concept in designing their new buildings. It would have been virtually impossible for us as architects to devise the "Learning

Center" type of educational concept. It is the result of many lifetimes of teaching, testing, and exploration by the Oklahoma Christian College staff. Ways to implement it are still being investigated, and new types of equipment are still being developed; but the initial concept is still the same, and now even more valid because of the increasing demands on educational facilities and teachers. With the prospects of cable T.V., micro-wave educational networks, picture phones, a nationwide facsimile transmission system, communication satellites, and new more sophisticated audio-visual equipment, the possibilities for the "Learning Center" educational concept stagger the imagination. Perhaps the most amazing aspect of this concept is that it was formulated before any of the new sophisticated communication systems were developed, and only now because of these new systems is the full potential of the "Learning Center" concept starting to be realized. I think you can understand now why the staff here at Oklahoma Christian College is so unique; and why, as architects, we are so grateful for our opportunity to be a part of the work they are doing.

Realizing the potential of a "Learning Center" is perhaps the essential factor that needs to be dealt with if you are starting to plan one for your institution. This potential implies that it will constantly be changing, and provisions need to be made to accommodate this change. This ability to change implies that the building should be flexible. Flexibility in a building means a great deal more than just column-free space, because a building of this type needs to be flexible in many different ways. It should be acoustically flexible which suggests that noisy seminar and group learning rooms could be located in close proximity to quiet audio-tutorial areas. It should be mechanically flexible and by that I mean that the heating and air conditioning should be designed to supply areas that may change in location and vary in their heating and air conditioning requirements. It should be functionally flexible in that a particular area may be able to function for a variety of uses. Also, space can be assembled quickly if necessary by staff maintenance people. This implies that a demountable wall system should be considered which may require a special ceiling system to stabilize it. The lighting scheme should be so designed to not restrict flexibility. The building should have equipment system flexibility in that new equipment can be incorporated efficiently. There should be the capability to provide a variety of electrical services throughout the building. The building should have maintenance flexibility so that computer and equipment rooms have convenient access to service areas. The types of flexibility we are talking about are not inexpensive. Providing a high degree of flexibility in *all* of these areas would more than likely be prohibitively expensive, therefore, you and your architect need to arrive at an optimum compromise and set up priorities as to the amount of flexibility you actually need and can afford The equipment is the heart and soul of the facility, and who can predict what may be available or needed 10 or 20 years from now. Every "Learning Center" can be different and still fulfill the same purposes. It is important to approach the design of any building, and especially a new "Learning Center" with an open mind and not have any preconceived ideas about what it should be; but a very definite idea of what it should do. I am reluctant, in this session, to make any statements about the design of this type building you may consider as sacred, but there is some guidance based on our experience that may be valid, and that you and your architect should consider. First, don't spend a lot of money on an unnecessarily monumental building. The equipment is more important. Oklahoma Christian College equipped their "Learning Center" initially for $800.00 per station. Recently, in Kansas, equipping a similar and new "Learning Center" cost $2,000.00 per station. Based on the types of equipment available 5 to 10 years from now, who can predict what the equipment costs will be. It will be your responsibility, as the client, to decide what type equipment you need and how much of your budget will be for equipment and how much reserved for building.

Second, do not have the equipment provided and installed as part of the General Construction Contract. You will be in a better position to buy the equipment yourself than the General Contractor. Doing it this way, the equipment supplier will be responsible to you for proper installation and operation. If the equipment is in the General Contract, the General Contractor will add 10% of its cost to his fee to provide for its installation, and the architect will add 6% of its cost to indicate it on his drawings, describe it in the contract specifications, and supervise its installation. That is 16% of the equipment cost you can save by dealing with the equipment manufacturer yourself. The architect does need to know generally the type of equipment you intend to use so that he can make provisions in the building for it and to insure that the required utilities are available. If the building is designed properly with a high degree of flexibility in regard to the installation of equipment, there should be no problem with providing it after the building is essentially completed. Your architect can assist you in scheduling this phase of the work to expedite total completion of the new building.

Up until last year, for the preceding five years, costs rose at the rate of about 3% a year. Last year the cost went up to 10%. So, the cost of a building is about 25% higher than it would have cost five or six years ago. In planning a new building on campus, do not attempt to go by the cost of a building already built; but add from 20% to 25% to that cost.

Third, consider prefabrication of some components. One way we have found to keep costs down is to reduce the outside labor. That means we are going to prefabricated and pre-assembled component parts for some parts of the building. There are many pre-cast concrete sections, prefabricated bathroom units, prefabricated wall systems, windows, and interior partitions. The architect can take these components and design erector set drawings so that the proper components come together and function as an integral part of the building.

Great economy can often be effected through use of package-type mechanical equipment units for heating and air conditioning. As the cost per square foot of building rises, it just is not feasible to put the mechanical equipment plants inside the buildings. On most new buildings they can go on the roof eliminating the need for floor space. Ducts can go down to the first floor supplying a retainer of hot and cold air. The units are easily accessable even to lifting off and replacing with another if necessary.

Due to the limited time of this session, we have been unable to discuss a lot of the topics which are important. By developing the right kind of relationship with your architect as well as assuming the responsibilities only you as the client can exercise, and by keeping an open mind and flexible attitude toward the project and having the determination to exert the effort required to achieve your objectives, I feel that your projects will be successful.

PREPARING MATERIALS FOR LEARNING CENTERS

DARREL J. MONSON
Brigham Young University

As a basis for a discussion on the subject, "Materials for Learning Centers," the definition of a learning center should be kept in mind that has been given in the symposium brochure. This definition is as follows:

> A learning center (1) has a variety of audio and visual learning paths available, (2) has both print and nonprint resources available, (3) affords opportunity for independent learning through audio and visual experiences, and (4) is integrated into the total curriculum of the instructional program.

The following five questions have been proposed as a basis for discussing the subject of "Materials for Learning Centers":

1. What are some of the types of materials that can be used in a learning center?

2. Are materials available for learning center use from commercial sources and how can these be located?

3. Can the faculty produce its own material and how can they be stimulated to do so? How can this be funded?

4. Will the development of minicourses with behavioral objectives assist in the sharing of resources by other institutions?

5. Do these materials actually result in improved learning or more efficiency?

The most difficult task in the operation of any learning center is that of obtaining enterprise and significant software materials. At Brigham Young University during the past decade, we have produced a physical plant, a staff of highly competent production people, and an organization that is highly developed. Three years ago we launched the beginnings of a highly needed instructional development program and an instructional research activity to guide the development of needed software, for we found that software materials at the university level were not widely available. Most software producers concentrate on materials on the K-12 level. Over the past three-year period, we have been highly absorbed in this development as it has been guided by sound developmental principles.

Nonprint materials come in three principal formats:

1. Audio-Video Types -- Motion picture films are available in 16mm and 8mm in many titles and subjects. At Brigham Young University, for example, we have approximately 4,200 titles, and we find them highly useful. We produce approximately 15 half-hour motion pictures in 16mm per year, in addition, to meet specific objectives for which no films are available. These, of course, are marketed generally to

help recover initial costs. Many companies are now marketing single concept loop films. Many of the commercial libraries are making their educational motion picture films available on both 16mm and single concept loop formats. The use of loop films makes individualized instruction much more logical. Many courses and course segments are being packaged on various formats of video tape and video film. Almost every university in the country of moderate to large size and state departments of public instruction have several courses so packaged. Several centers in the country specialize in the circulation of these types of materials. Several such centers are:

a. Great Plains National ITV Library, University of Nebraska, Lincoln, Nebraska 68508

b. Michigan Classroom Television, 600 East Kalamazoo, East Lansing, Michigan 48823

c. National Instructional Television Center, Box A, Bloomington, Indiana 47401

2. Recorded audio materials are widely available and are highly developed. The National Tape Archives at the University of Colorado in Boulder, Colorado, has approximately 12,000 subjects available. Many commercial companies make educational materials available on both disc and tape. At Brigham Young University we have approximately 5,000 audio tapes that we use in our program. A total of 21 people at BYU are engaged in recording activity. We use annually 8 million feet of audio tape on reels and approximately 71,000

cassettes. Every time we have a telelecture we ask the individual giving the presentation if they would allow us to tape their remarks for use later on the campus. With very few exceptions, permission is readily granted. These people are willing to allow themselves to be taped for use in our own institution, but they are not ready to allow us to market the tapes--and understandably so.

3. In addition to these materials, there are, of course, many slide sets, overhead transparency sets, models, pictures, and objects available. Overhead projectors in some schools are getting to be as common as blackboards.

Insofar as our experience shows, one of the best catalogs listing all of these materials is the Westinghouse Learning Directory. There are actually seven volumes in this set, and they are available for under $100. The volumes are updated and reprinted each year so a current set may be purchased. In addition to the Westinghouse publication, additional indexes of materials are the following: NICEM Index printed by the National Information Center for Educational Media (ten volumes) and the Library of Congress Catalog (published three times yearly). In addition to these indexes, good sources of information for materials are the professional journals, such as *Audiovisual Instruction*, the official journal of the Association for Educational Communications and Technology (AECT). The annual conventions of AECT and ALA (American Library Association) have media shows where a large collection of materials is displayed. Incidentally, AECT used to be known as DAVI, the department of Audio Visual Instruction which was part of NEA, the National Education Association.

Response from the Audience: It seems as if there is a basic mistrust of software producers. Users don't trust what is being said by producers because they have been burned so many times. They have read statements concerning what a product or a given film will do. They order it and then are disappointed. I am wondering if perhaps some of the producers and publishers who have something in which they are really confident and which they claim will do a great job, would mind sending out more of this type of thing on preview. This would put the material in the hands of the public schools and colleges. I suspect that this raises the question, "Isn't there some kind of publication agency which is screening the various kinds of materials?"

Yes, there are groups who preview materials. There are committees that are part of AECT who sometimes publish summaries of this kind of material. However, this is not routine procedure, and you have to rely on personal inspection. We at Brigham Young University have had this problem for years. We have now set up a separate section in one of our departments to gather information concerning available commercial products whenever such materials look promising. Information is sent out to faculty who might be interested in previewing the material. The actual cost of operating such a section is much less than the cost of producing the materials ourselves.

The production of educational materials is very expensive and the little time and money spent on getting the materials for faculty preview is an economical expenditure. For expensive types of materials like motion picture films, producers will usually send the materials to an educational group on a preview basis. This is also true occasionally for other kinds of materials. Audio tapes are not usually available for preview. One tape producer tried this and found that about 30% of previewers dubbed a copy and sent the original back. Anyone who is truly concerned about the availability of materials should write to producers and ask them what their preview policies are.

Of course, it is possible for faculty or para-professionals to locally produce the instructional materials that are needed. Although many different kinds of procedures may be used to stimulate this production, the principal problem is, of course, the budget. At Brigham Young University we made quite an extensive study before we finally adopted the production policy on which we are now operating. The policy is not uniform for all kinds of materials due to the wide difference of production costs. May I summarize what we do:

1. For motion pictures the budgeting is carried on by several different processes depending on the end use of the product. For films produced for outside agencies, contracts are entered into in which the entire cost of the motion picture is paid for by the sponsoring agency. Where motion pictures are to be produced for educational purposes, one of three procedures is followed:

a. If the film has a market, it is produced out of an educational film revolving fund. After production of such films, our marketing department will sell prints and replace the production costs. Prints for our own purposes are purchased out of the same fund that buys prints for our motion picture film library.

b. When films are needed in our educational program that are not generally marketable, the funds for the production must come from the individual departments who require the film.

c. In some cases in (b) the departments will submit their requests to the Instructional Development Program (this will be discussed later) and funding comes from special IDP appropriations.

2. Software materials such as transparencies, charts, graphs, etc., are produced for academic purposes by asking the academic department to pay only the materials cost. There is no charge to them for any labor involved. For example, overhead transparencies cost no more than 10¢ to $1.50 per unit for the materials depending upon the process that is required. In addition, facilities are provided where the faculty member can make his own visuals if he wishes to do so. Photo typositors, large type typewriters, and similar equipment is available. Making it possible for visuals to be produced either by para-professionals or by allowing the faculty to do it themselves has several advantages:

a. Work produced by para-professionals can be of higher quality.

b. Because of the necessity of keeping the para-professionals occupied, work must be handled on a scheduled basis. Because of this there is sometimes a delay in getting work out. Under these conditions. if the faculty wishes to get their materials out in a hurry, they may do it themselves.

Where the para-professionals are to be used, we suggest that work be scheduled two weeks in advance. Sometimes this time is shortened because of a low backlog, but other times two weeks is required. It is important to give the faculty the privilege of making their own materials because they often do not have the lead time. As a concept is being taught, a need may become apparent that an overhead transparency is needed for the following day's instruction.

The cost of materials for visuals is not enough to prohibit any department from getting overheads when they really want them. On the other hand, it does deter them from asking for overhead transparencies indiscriminately. If a professor comes to our Instructional Photo/Graphics Department, material requested is produced for him without any clearance or question if the total production job is less than $100 and if a standing CPO (campus purchase order) is on hand from his department. If the production costs over $100, the approval of his department head is requested.

3. Television production costs are handled by procedures depending upon the type of television production.

a. The utilization of portable television systems, of which 25 are in service on the Brigham Young University campus, is handled by departments themselves. They furnish all materials and personnel with the exception of one trained operator that is furnished. Thus, all production costs with the exception of the single trained operator, are borne by the department utilizing the equipment.

b. Where productions occur in the regular television production studios, all costs are borne by the department unless they find funding elsewhere. This does not include the charges made for supervisory personnel in our instructional television section, but all television crews costs are borne by the department. This also includes the costs of video tapes. An exception to this is when the program is funded under the Instructional Development Program that will be described later.

c. If extensive television production efforts are to be carried out, the funding procedure becomes similar to that used for the production of a motion picture film.

In the case of extensive production such as the production of visuals, films, or video tapes for an entire course, funding may come from an overall Instructional Development Program (IDP) appropriation, Funds from IDP (which amounts to about $200,000 for our campus for this year) are dispensed twice a year by awarding amounts based on proposals submitted by departments or colleges for instructional development program projects. These projects, which usually utilize instructional design teams in the development process, always require some evaluation of the educational result. The design team includes educational psychologists, measurement and evaluation specialists, media specialists, and any other specialized talent that the projects require. The project funds not only pay for the production of materials and for the team members but often pay for released time of the content specialists, the faculty members. Such projects may actually represent an entire course or just some course segment. Such project awards range in value from $100 to as much as $15,000 or $20,000. Proposals that are submitted must have the approval of a department head and the dean. After submission, they are reviewed by an executive committee of the Instructional Services Division and are then submitted to a faculty committee jointly appointed by the Academic Vice President and the Division of Instructional Services known as the Instructional Development Advisory Committee (IDAC). Questions may be asked and modifications in the proposal may be required, but finally when the project is approved the funds are given out of the overall budget allowed to the Division of Instructional Services for the IDP.

Let me suggest some examples of projects that we are now funding:

1. We are doing a complete renovation of a fundamental physics class in which we are utilizing closed circuit television on an individualized instruction basis along with lectures and problem sessions. The overall cost of presenting this course has been reduced approximately one-third and the overall performance of the students has increased approximately 40 per cent. Incidentally, this class may be finished any time the student wishes to finish it. He is not in a lock-step class procedure. He also may retake an examination after further individualized study.

2 We are doing a complete fundamental design of a basic English curriculum.

3. We are doing a complete rerun of a basic American history class that was originally done on television.

4. We are doing work on an audio-tutorial method for teaching basic zoology.

5. We are working on several units of a psychology course.

6. We are producing some audio-tutorial materials for instruction in machinery for an industrial education curriculum.

At the last count this year we have awards being expended in all thirteen colleges within the university. A total of 37 projects are involved. This instructional development activity includes productions in many forms of educational media, such as audio tapes, slides, transparencies, motion picture films, video tapes, programmed instruction, computer-assisted instruction programs, evaluation of mini-courses and individualized printed material packets. In most of these, behavioral objectives are being written. Specialists are devising the strategies, developing the materials, developing the testing instruments, and are helping to provide significant evaluated programs. We have completed a number of projects. We have not batted 1,000 on quality on everything we have done to date, but we are developing models of instruction and instructional packages that will make succeeding attempts much more fruitful. We do not believe that instructional materials should be developed with reliance on empirical data alone. We apply learning theory wherever this is available.

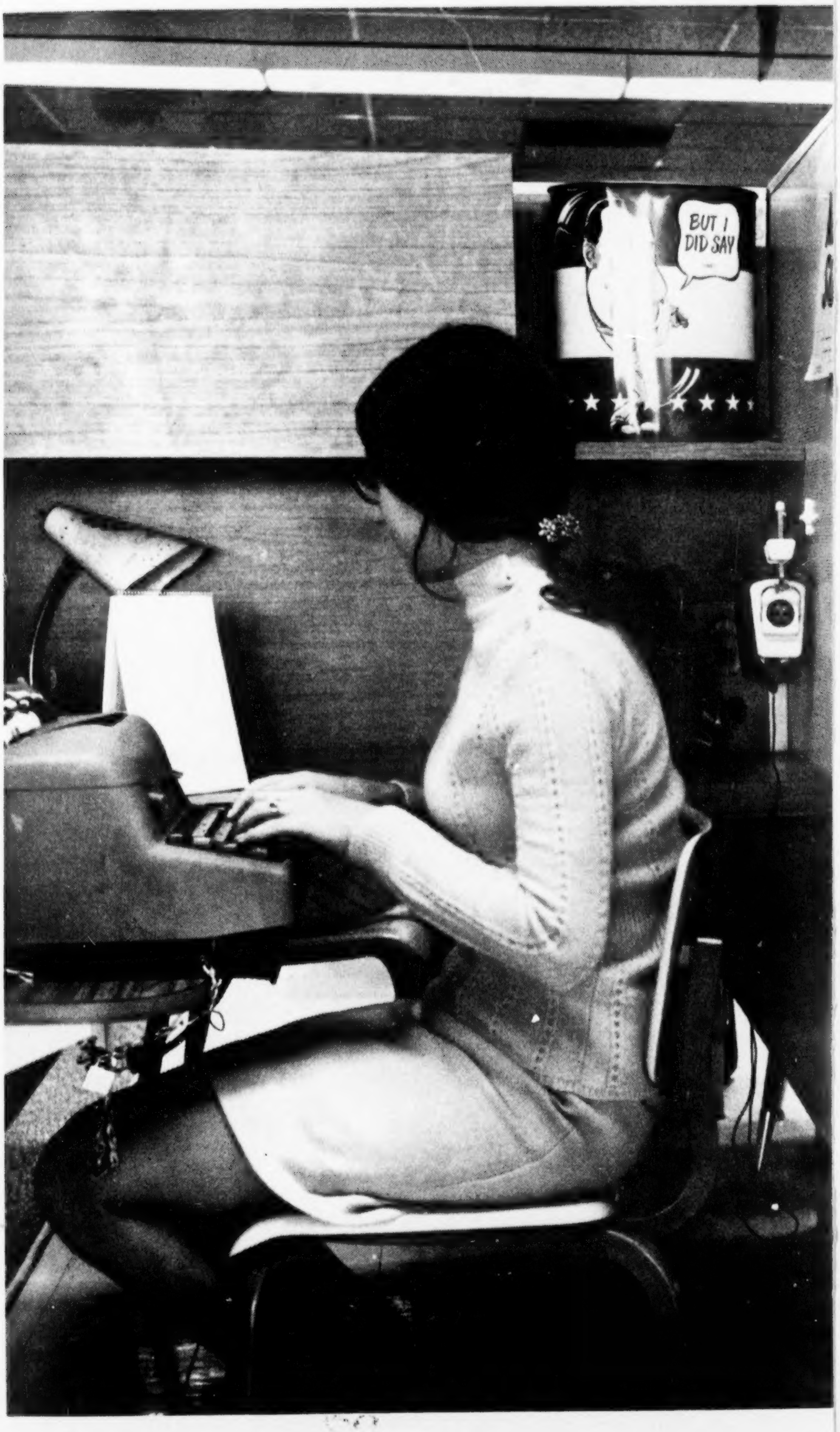
At the AECT meeting to be held in Philadelphia later this month, a session will be conducted where five universities will present elements of their instructional development programs. I would highly recommend that any who are interested in instructional materials production and the utilization of instructional materials in instructional systems should attend the session.

Question from the Audience: In your discussion you mentioned the use of 16mm film and how there are many commercially produced titles. How do 8mm single concept films fit into this picture? We have quite a few inquiries in regard to these, and since I am with the State Department of Education, I was wondering if there is an opinion concerning the use of these materials in the elementary school primarily.

There is little doubt that 8mm single concept loop films are becoming more important on the educational scene. At the present moment, BYU does not have a large library of 8mm films, but we do have a very large 16mm film library. We are moving in the direction of 8mm loop films, however, and have recently purchased quite a number of prints as well as hardware to make them available for both individualized instruction and for group viewing. We produce motion picture films in 8mm, 16mm, 35mm, and 70mm. Most of our production, however, is in 16mm. As a matter of fact, we generally film in 16mm even though we intend to utilize the films on 8mm for student use. We have found that the actual cost of 16mm film for production is not very much more expensive than utilizing 8mm, and the quality, of course, is higher. In addition, filming in 16mm makes it possible to have 16mm copies of the film. It is very simple, of course, to produce 8mm copies from the 16mm master. As we continue to move in the direction of more individualized instruction, we will continue to use a higher percentage of films in the 8mm format. As nearly as we can determine, this is the direction in which both public schools and higher education are moving. I would highly recommend that school systems seriously consider adapting their film programs to include super 8mm film. Incidentally, many producers of films are now making much of their footage available on super 8mm.

Question from the Audience: There are a lot of schools developing their own materials. Is it possible that before long, say in a matter of ten years, there will be a huge pool of material around the country and will it be necessary for the individual school to develop its own audio-visual production capability?

I am certain that over the years more and more commercially produced material will be available. We at Brigham Young University have been in the process of marketing 16mm films for many years. We are now in the process of developing a marketing operation to handle many other kinds of instructional materials. I know that a number of other universities are doing the same thing. Our marketing operation, however, is one that will market only those kinds of materials that commercial producers will not want to market for us. We would much prefer commercial companies doing the job, inasmuch as they are set up with salesmen and other kinds of distribution functions for which we are not adequately prepared. Marketing instructional materials is not our business. It is the production of them when we cannot find them commercially available and the use of them in the instructional process for our own students.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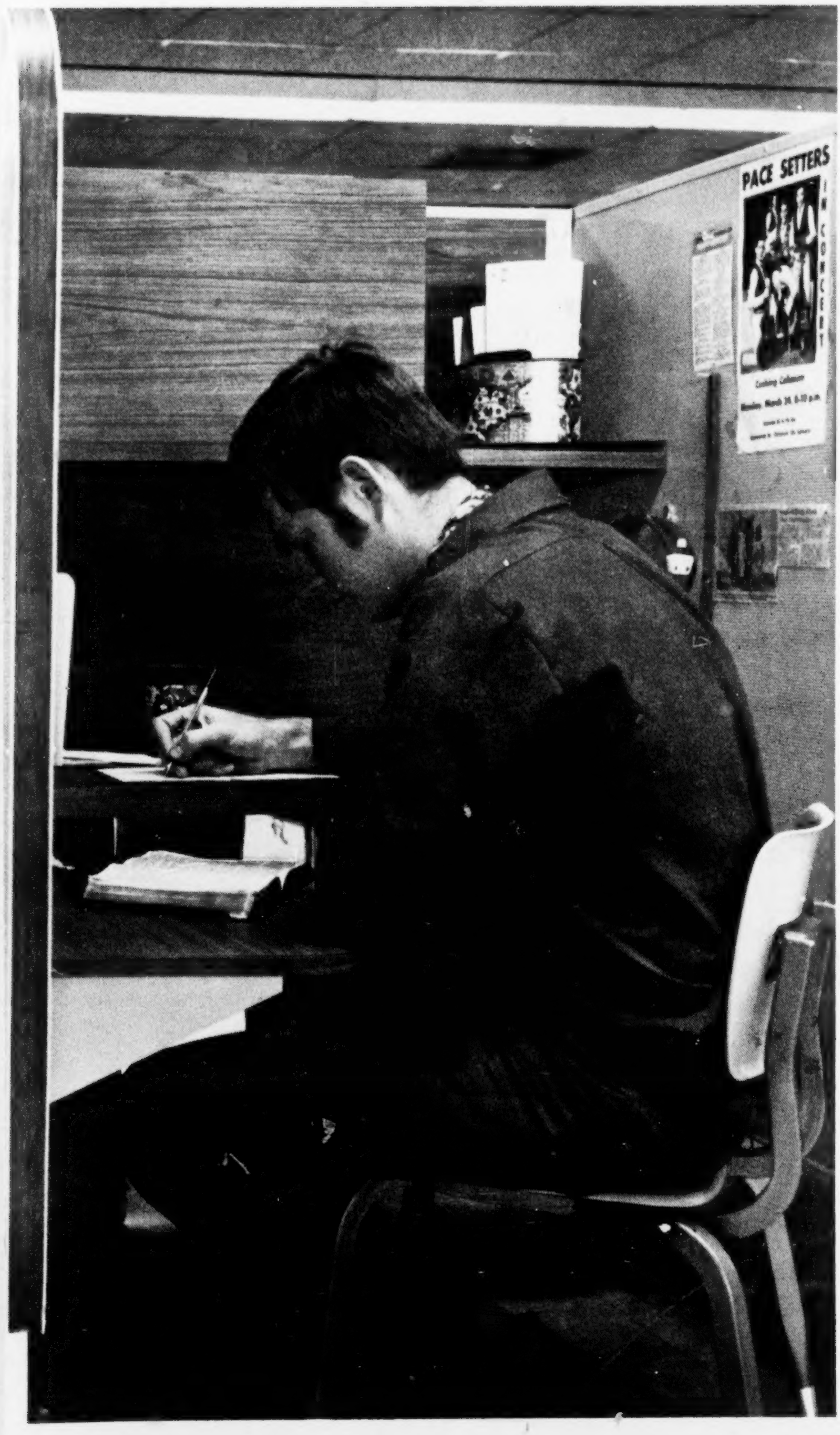
PACE SETTERS
IN CONCERT

Perhaps even more important is the current effort on the part of commercial companies to start gathering up instructional materials from public schools and universities for distribution just as they have been gathering up books for publication for many years. Contracts for materials produced by schools will be negotiated by commercial companies so that wide distribution of such materials will become common. These companies are now producing catalogs of instructional materials, and it is therefore important that teachers and faculty members at all levels become acquainted with the catalogs of non-print materials just as they, for years, have become acquainted with catalogs of print materials. I feel, however, that any sizable progressive educational agency should have its own production capability. There are always instructional materials that are individual to an educational institution. I do not think that each institution should establish a complete 16mm motion picture sound stage with all its costs, but facilities should include the capability to produce many kinds of still photographic materials and could very easily expand to the making of simple super 8mm concept loop films. As a matter of fact, several grade schools are experimenting with programs where the students make slides, overhead transparencies, and films. I know that many school districts are setting up facilities to produce instructional materials for the entire district. Sometimes districts combine to sponsor regional production centers.

Many types of production equipment are fairly inexpensive. An infra-red copier, together with a variety of transparency production materials, can provide considerable capacity toward making overhead projectors useful in the smallest of schools. Kodak's Instamatic Camera with an associated stand makes it possible to produce 2 x 2 slides very inexpensively. These plus a dry mount press and a few basic graphics materials can transform the intelligent teacher into a user of instructional materials that are produced locally.

Question from the Floor: Do you agree with the fact that a lot of motivation for educational institutions is coming about because they say, "We would rather not do it; but since nobody else is, we have to do it."

I am certain that is correct. I know that at Brigham Young University we would not produce many of the materials we do if they were available from some other source.

One of the trends that is emerging in the instructional materials field is the production of materials to cover small units or concepts rather than extensive sequences. As a matter of fact, it is becoming common for educators to use segments of films, rather than entire films, for specialized educational experiences. Educators by nature want to do things their own way, and educational materials put up in small discreet learning packages are much more readily adaptable to a wide variety of educational situations than when they are put up in large packages. Just as an instructor is reluctant to recommend a textbook to his students where only four out of twenty chapters are going to be used, he also has some reluctance to purchase educational materials if the greater portion of it is not usable in his class.

We are beginning to see a trend where small, paperbound books or readings having a limited number of subjects are becoming popular. Similarly, open-end films, single concept loop films, and brief audio tapes are becoming more and more available. It would seem to me that the day will soon come whereby an instructor will be able to specify to a commercial producer the kind of subjects he wants in an educational package. The producer will be able to put the package together out of small units that he has on his shelf. This will be true whether we are talking about non-print or print materials.

The problem of clearance for the wide use of locally produced instructional materials can be complex. We have just concluded a three-day conference in Salt Lake City sponsored by BYU and the Law Institute of the University of Southern California on the general problem of residual and copyright clearances. Clear-cut residual policies have not emerged in this country and will probably be unclear for several years to come. In case anyone is interested, the proceedings of the conference are available on tape and can be purchased by writing to the Instructional Services Division, 243 HRCB. Brigham Young University, Provo, Utah 84601.

A pertinent question about the utilization of all these materials in education is, "Does learning improve through the use of educational media?" The answer is not always clear. However, it seems to me through the experience that we have had and through the data that has been published, improved learning does result when instructional media and instructional materials are used appropriately. Most published data suggest that the use of instructional media results in no significant difference in the instructional results achieved. Some applications do result in significantly greater learning. We have had such results at BYU in several courses.

It is important to understand that each type of instructional medium has its own particular characteristics and should not be used indiscriminately. Where factual material is to be presented over and over again, it seems to me to be unwise to waste the time of a good instructor to just parrot the material. A mechanical instructional system which can present the material as well or better than a live instructor should be used. This will then allow the instructor to do the kind of thing that he is best suited to do--interacting on a personal basis with students. It is what you do with the medium that makes it good or bad. We have had some miserable failures in the application of media at BYU. I do not particularly advertise our failures, but I can tell you we have learned considerably about the application of instructional materials and instructional equipment. This is why in all of our instructional development programs we tell the faculty we are not going to fund their projects unless they let us evaluate what happens after the instructional materials, the learning sequences, and the instructional process get together. We want to know whether a usable result has been accomplished so that we may or may not repeat the process as the evaluation data gives us guidance.

It is important in the utilization of any instructional material center to train the faculty in the use of such a center. The training should include information as to when and how to use it as well as how to produce the materials for it. At

Brigham Young University we approach this training problem by using the following techniques:

1. Several graduate level courses are made available to the faculty members. The courses, which may be taken for credit or on a noncredit basis, teach the faculty member the basic information necessary to properly apply media and to produce it. These classes include instruction on instructional techniques, on the overall instructional design process, and on production techniques.

2. Short seminars are made available to individual faculty members, to departments or colleges on selected instructional techniques and media production. A list of 36 such seminars is published each year.

3. An annual faculty workshop is presented at the beginning of the year to acquaint the faculty with instructional matters.

In all of the programs listed above, outside faculty are used as well as local faculty. Whenever a faculty member wishes to take one of the graduate classes in instructional techniques, his teaching load is reduced by an amount equivalent to the graduate class taken. Over the past few years we have managed to train 15 - 20% of our faculty in these graduate classes. Another technique that we have recently started using is that we will give our Instructional Development Program project grants to a faculty member much more readily if he has taken the graduate class on instructional development techniques. As a result of all of these programs, our faculty are becoming very sensitive to the need for system development in instructional activities.

We are becoming ever more aware of the necessity for careful evaluation of the results of the use of our instructional learning resources center activities. We are currently in the process of designing a computer processor to monitor many types of learning activities used on campus. This will include, of course, the monitoring of our information retrieval systems, the use of our vast network of audio and video cables in transmitting data and information of various types around campus, and of monitoring various student response systems on campus. Information is being kept on the utilization of portable cassette tape players in some of the tours that our students take through this means. This includes many of the audio cassette tours in the library and in the various laboratories and museums on campus. All of this data provides a basis for two types of decisions that we must continually make:

1. Is the type of learning process an effective one?

2. Is the process economical? We feel that all of our programs must be cost effective. That is, we must be getting good learning experiences out of the dollars that we invest.

Someone has asked a question regarding the type of materials that can be effectively used on an individualized study base in a study carrel. As we have reviewed the answer to this question at our university and others, we find that the following types of equipment are usable:

1. Slide projectors
2. Filmstrip projectors
3. Audio tapes

4. Single concept loop film projectors in both silent and sound forms.

5. Video tapes

6. Print materials in various formats including programmed instruction texts, involvement sheets, and other workbook materials.

There are a number of types of equipment that have either just come on the market or will be coming on the market in the next year or so that will affect the direction which some learning resource centers will take. Types of this equipment are as follows:

1. Audio cassette players are now here and are becoming very common. The kind of equipment that will modify the use of these audio cassette players considerably is the high speed cassette duplicator that operates by having a customer put 25¢ in a slot and a cassette. The customer then enters information from either a dial or push buttons which selects any one of a vast resource of audio materials. In just a few moments a cassette with the information transferred onto it is returned to the customer. This will make it possible for a customer or student to get audio materials from a vast bank of audio materials that is stored on many different instructional subjects.

2. The age of cartridge television is here. This includes EVR (Electronic Video Recording) from CBS, Instavision from Ampex, Cartrivision from Carter, Cartridge Television from Sony, holographic video recording with laser beams by NBC, video disc recording from Teledec, and other brands. All of these systems have capabilities that are useful in

individualized instruction techniques that are used in learning centers. Time does not allow me to give a complete description and the characteristics of each of these, but they do and will allow video information retrieval that has not been economical in the past.

We are predicting at Brigham Young University that within a few years each student will have an audio cassette player just as commonly as he has a book. It may not be many more years after that until we reach a place where video cassette players will be almost as common. In almost all cases we limit our audio recording to 30 minutes in length. In some special cases we may go beyond that. This suggests that the C-60 cassettes are long enough to hold most of our instructional information. There are many brands of audio cassettes on the market, and I would suggest that any user of this type of container of information make a careful investigation as to the quality of cassettes before they are purchased. Audio cassette players are available from many manufacturers, and I would caution users to make an investigation of the reliability of equipment as well as the availability of repair parts or repair service before investing in a large number of units.

May I give a testimonial concerning the utilization of audio and video retrieval techniques. Up till two years ago we had at Brigham Young University a 100-position manual audio system. In addition, we had two 100-position language laboratories. We have recently installed a 240-position dial access system. We now also have available 500 cassette tape players on a check-out basis, in addition to encouraging students to obtain their own. We have installed a number of wireless audio loops in our library than handle large class audio tapes and are currently entering into negotiations on a rate structure with the telephone company to expand audio retrieval to all on-campus and off-campus residence halls. Further, we are negotiating with a local cable television company to install multiple channels on the television cable system that will reach all homes in the area in which Brigham Young University is located.

EQUIPPING LEARNING CENTERS

WILLIAM JERNIGAN
Learning Resources Director
Oral Roberts University

Question: If you are advocating dial access more or less for large or mass instruction, what's the advantage of the dial in this respect? If you do have a large number of students who want to see the same program, under a dial system, the second student comes in where the first student was, so wouldn't it be just about as simple to plot this and publish a schedule that will start it?

Answer: We do schedule our video. We find that it is very impractical to have a student randomly dialing in. The dial enables us to make a large number of individual stations available to the students with a minimum amount of wiring. If you had a large number of stations available on campus, then if you did not have dial, you would have a large number of cables going to all of these stations. This would require a lot of maintenance and switching. This has been my observation in relationship to such an installation. Dial access for a small number is not necessary. If you've got, say 12 video stations and 12 audio stations, go to a simple switching schedule. But if you are going to a large number of stations and you have a large number of sources, then there is a financial break where it is more economical to have dial access system than it is to pull all the cable necessary for a manual switching type of arrangement.

Question: That was the source of my question--why bother with dial if you are going to start it that way?

Answer: The dial access gives you a greater versatility. However, you have got to decide in comparison with dial and manual switching what you want to do; how sophisticated you want to be. Can you afford to have any type of sophistication in this particular area? I think within this decade there will be a dial access system available that will do what a scheduled system will do today. You will have high speed duplicating equipment in a central area and I think there will be some interaction with computers by way of dial. The next 10 years will show a tremendous change in this area.

Question: Just a little bit off the subject, but I'd really like to know, how do you motivate freshmen to go in, sit down, plug those things in, and listen to them? What feedback do you get with the faculty?

Answer: Motivation starts, not with students, but with faculty members who in turn motivate the students. If the faculty member schedules material in the dial access system, that's the only way the student is going to get the material. That student is going to be motivated to listen to material. We motivate our faculty by providing either released time or special contracts. Other factors influencing their involvement are: (a) in their contracts is a commitment to the systems approach to learning, and (b) when they come to ORU they know what we are, what we are doing, and they are interviewed very closely in relationship to our commitment to this type of instruction.

When a new faculty member comes to ORU he is provided with a 6 weeks orientation session. In these sessions he is made aware of the personnel available to him to make his task as easy as possible. The Learning Resources team is dedicated to help the professor do a better job and to be innovative in his work. In using the team approach, I work with the faculty member in the development of his course syllabus with special consideration being given to his behavioral objectives. He then moves to the Director of Educational Media where each particular lecture is worked out along with the type of format he is going to use. Then we bring in the Graphics Department and the Learning Resources Librarian, who either produce the visuals in-house or purchase them from outside. Meanwhile, the professor is recording his lecture on audio tape for the first time. He then listens to it and if he wants, we will get a script of it for him. He then edits the script and when he has rerecorded the lecture we insert slides that will illustrate his topic. We then have what we call a kit or programmer tape-slide presentation that is used in the dial access system. We deviate from this procedure only slightly for the production of video tape.

Question: Which do you use most--tape-slide presentation, video tape, or audio tape?

Answer: The tape-slide is the most popular. We have 60 per cent of our general education courses totally taught by dial access. It's more economical to have these courses in a tape-slide format. Currently we have only one entire course on video tape. A second one is almost finished.

Question: Do you use motion pictures?

Answer: Yes.

Question: How do you distribute this type of slide? Or is it by television?

Answer: It is by television, only multiplexer. There is a 2-inch carousel projector on a pedestal projecting into a mirror which reflects into a television camera. The audio tape has an electronic pulse on Channel B that controls the changing of the slides.

Question: Is it black and white or color?

Answer: We have both. We have two video islands that are color capable and two black and white islands. All of the VTRs are color capable.

Question: How should an institution go about setting up a media program?

Answer: I would suggest that you operate on a five year plan. What do you want to be able to do five years from now? What are your long range plans? Then what are your intermediate objectives along the way? When you get these clearly stated, then you can examine what equipment will best meet a particular objective. I feel that the employment of a qualified consultant is the best way to plan for a Learning Resources Center. In order for a consultant to be of value to you, however, you must be able to clearly state where you want to go in your program.

A possible way to approach a media installation would be to start with the cassette recorder. This is probably the simplest of the modes. If you start out with cassette recorders and you distribute the sets to your students, you will need to install some high speed duplicating equipment in order to meet the demands for tapes. When you accept the cassette you lock yourself into the cassette format. This format will determine the type of audio machines that will be in the larger retrieval system. It will also enable you to produce programs immediately that will be compatible with the larger system at a later date. Next you may move to a simple remote retrieval system that may be located in the library. You then may desire the following year to move to a scheduled video signal that will work in conjunction with your scheduled audio system. Possibly the next year you would want to merge the audio and video together and then by the next year make your audio and video retrievable by dial access. Dial access, you must remember, is nothing more than a computer switching arrangement that gets remotely accessible material to the student via a smooth switching process.

Question: How do you convince an administration concerning the need of an outside consultant to come in? I am convinced of the value of it, but my administration says, "Well, you have some training in this--you ought to know all the answers."

Answer: The thing that talks to administrators is money. If you can convince them that they will save money over the long run by having one of these men come in, then you will probably be successful in communicating with them. To do this you must get a qualified consultant who will produce a quality program. There are a lot of them available today that will not do any better than you will do. You must check closely on their qualifications.

A consultant is only able to do what you are prepared for him to do. If you haven't drawn up your program, if you don't know what you are doing, a consultant is not going to do you any good. If you know where you are going and what you are going to do, and you've got your program systematized, then he can pick it up and help you develop a quality program.

Question: I'm thinking that this small hardware like earphones and tables, and then cassette recorders and then individual viewers and large viewers--do you have any company that you would recommend? I've heard so many different prices.

Answer: When it comes to headphones, I believe Telex probably is the best. There are several companies producing good headphones but we find that Telex phone is reliable for our needs. In choosing a cassette recorder, I'd choose Norelco. One thing you need to be careful of is that you specify what you want a cassette recorder to do for you and then go out and find a machine that will do it. Norelco was the first one to design and patent the process of the cassette, and they have sold this to just about every other cassette manufacturer. You will find a number of prices on cassettes and you will find many, many names. If you examine closely, however, you will find most of them are made in Japan.

Question: What about viewers or filmstrips?

Answer: For further information on equipment, I suggest that you consult the National Audiovisual Association's "The Audiovisual Equipment Directory," and the Educational Products Information Exchange that has a publication known as "EPIE .

Question: What is the maintenance cost on your system?

Answer: Audio is reasonably simple and is not real expensive to maintain. But when you get into video, the price is much different. You almost double your cost as far as installation and maintenance. You've got to have more sophisticated personnel to take care of this type of equipment. When you put in a dial access system you've got to have a capable technical staff to handle the equipment. Therefore, it is not only the hardware that you should be concerned with. You should also be concerned with the day by day operation of the equipment. The academic facet of the dial access system at ORU, along with supporting services, would probably cost around $90,000 a year. When production is included in this figure, you bring another factor in for consideration and therefore your budget will increase considerably. Some institutions will place the production into the budget of the Learning Resources Center, and some will place it into the various departments requesting the work to be done.

Question: How about high speed duplicators?

Answer: Are you talking about cassette or reel to reel? (Answer - cassette.) The best way to duplicate cassettes is reel to reel, using a quarter-inch tape and then build your own cartridges after you duplicate them. It is virtually impossible to high speed duplicate cassettes.

Question: You started with a "green" faculty. How did you in-service train them?

Answer: We started not only with a "green" faculty, but with a "green" administration as well. We tried a few workshops but they were not successful because we didn't really know where we wanted to go. So about three years ago we took a long look at ourselves and what we wanted to do and where we wanted to go, and then we started. Since that time we have been having new faculty workshops and whenever possible we involve more and more of the older faculty members in this program. We are planning now to have one or two faculty retreats a year where we will be working on a systems approach to instructional development.

DETERMINING COST OF LEARNING CENTERS

MARSHALL GUNSELMAN
Dean of Learning Resources
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Summarizing from the report by the Commission on Instructional Technology on "*Cost and Costing of Instructional Technology*" one will find five major points:

"1. Only a small percentage of the annual budget of any school, college, or university is available for instructional materials (including books). (This amounts to no more than 4% of per pupil expenditure in the public schools).

"2. The costs of instructional technology vary widely, depending upon the range of equipment and services.

"3. The costs of instructional technology could be reduced in a number of ways:

(a). By increasing the number of students who receive instruction through a particular technology or by increasing the period of time over which the equipment is used.

(b). By stepping up the output of products that educators want.

(c). By designing and building machinery specifically for instructional purposes.

(d). By increasing the speed at which a student learns.

"4. Most data on costs of instructional technology lack the necessary scope and depth to help education's managers make policy decisions.

"5. The costs of instructional technology cannot be considered in isolation. They must be compared with the costs of other forms of instruction, as well as the real costs to society of an unproductive education system."

One could conclude that little has been put forth in the way of funds to actually test the real efficiency and effectiveness of learning resources in general. That which has been expended has been handled by fiduciary accounting rather than systems analysis and cost accounting. Fiduciary accounting is designed to give information regarding source of funds and whether they were dispersed according to budget authorization. It is of little help in determining effectiveness of the instructional process, however. This means that few firm conclusions regarding costs of learning resources can be made with absolute certainty.

Does use of a learning center cost more?

Certainly the cost is more if the use of a learning center is simply added to traditional methods. If an institution uses its learning center as supplementary to regular classroom instruction, the institution must be prepared to allocate more funds to the instruction budget. This is not necessarily bad if greater learning is the result. And, this could reduce the failure rate and may reduce the number of courses needed in an academic area.

Use of a learning center need not cost more, however. By altering some of our traditional (and possibly ineffective) patterns of instruction, savings can accrue. For instance, a faculty member can lecture to as many students as can see and hear adequately. If his technique is lecture, he might as well lecture to a group of a thousand as to a group of thirty students. And, most courses need some amount of lecture activity, at least for inspiration and motivation. The time and funds thus saved by lecturing to a large group are ample to allow for skills development through the learning center and even for small group interaction sesssions.

There are three ways of reaching students--presentation, interaction, and individual study. All three can be effective and should be used in combination to create the most conducive learning environment. In the past, educators have concentrated almost wholly on presentation as a vestige of the medieval university. By using a learning center or other technology for development through individual study, the opportunity opens for inclusion of interaction experiences, which can foster more relevant learning. Relevancy, of course, is one of the greatest needs of higher education today.

In a study of cost per credit hour taught of all higher education institutions in the state, the Oklahoma Regents for Higher Education found that the lowest cost was for the freshman and sophomore years at Oklahoma Christian College which uses this approach to education. Studies conducted by OCC indicate that this approach is just as effective in learning outcomes as other methods.

A direct answer to the question of whether use of a learning center costs more: It may cost more if the objective is greater learning while retaining traditional meeting patterns. But, at the same time, the cost need not be greater if school people are willing to alter their teaching arrangements.

How is faculty load affected?

A formula must be worked out for faculty load which is different from the number of credit hours taught or the faculty-student ratio. Actually, these were never fair devices since they did not take into account laboratory, advisement, and other valid faculty activities.

The new formula must allow for a faculty member to meet with students in small groups and individually, and this to be counted a part of his work load. Again, this may not call for any greater total expenditure than if the same faculty met with students in classes of thirty to fifty. An adequate formula is not yet in wide acceptance. But, it must be forthcoming to avoid widespread faculty discontent, even if traditional methods are retained.

What does a learning center cost?

Cost of learning center housing is about the same per square foot as that of a regular classroom building. By the time it is equipped for multi-media individual study use, one could expect its cost to be about the same as the cost of an equipped science building. Just as science buildings vary a great deal according to the type and quality of equipment, so does a learning center.

Cost per "wet" carrel usually varies from $500 to $1,500 according to equipment used. Those using dial access video probably will run up to $6,000 per carrel.

Some institutions have combined their learning resources in such a way that space for multi-media use is shared with traditional library use. A traditional library usually seats from one-fourth to one-third of the student body. By utilizing some of this space and furniture for multi-media use, substantial cost savings can be made.

Although exact figures cannot be given because each system is different, the cost of a learning center is well within the usual costs for other buildings requiring equipment and laboratories.

Can cost be justified for a dial access system and individual carrels?

Dial access audio is justifiable if used by a large number of students. In this way one resource may be shared by many. Making copies, having and maintaining many pieces of equipment, and the simple logistics of check in and check out make the library system inefficient if not impossible, for use by more than 200 students. If only a handful of students will be using a particular tape, however, it is certainly better and less expensive to utilize cassette tapes and players.

At this stage of development, it is difficult to justify the dial access video on the basis of cost in most instances. Video adds tremendously to installation costs and the systems are not yet as trouble free as with audio dial access. Master antenna systems have been used for years by hotels, and cable television systems are spread throughout the country. At this time, it would seem more feasible to utilize the master antenna cable concept (MATV) in learning centers, which would combine off-the-air educational programs with school produced videotaped and live lessons.

Regarding each student being assigned an individual carrel: It will cost more for each student to have his own. This is simply a matter of numbers of carrels to be purchased and maintained. Usage studies indicate that usually no more than one-fourth to one-third of the carrels are in use at any one time.

Purely on the basis of cost, it could be concluded that individually assigned carrels would not be necessary. On this same basis, it can be concluded that an individual bed is not necessary for sleeping and certainly that individual faculty and administrative offices are not needed. Students are in groups nearly all of the time--in the dining hall, in classes, in recreation, and most have at least one roommate. A student needs some place which is his and his alone. He needs to feel that he is a "somebody" and not just a number. There can be no doubt that present-day students feel this need. In his carrel, the student has a place to keep his own materials; he can get away from the crowd and be by himself; and he can express his personality through his carrel decorations. And he might even study a little now and then, since it is easy to get a psychological "set" for study when he does not have the normal interruptions of the dorm room.

Graduate institutions have long had individual study carrels in their libraries. They have been able to justify the concept without any mediated instruction. How much more can their importance be demonstrated with the multiplicity of media available today?

What kind of operating expenses can be expected?

Electronic and mechanical equipment always require maintenance, which must be done by trained personnel. A full-time engineer or high-level technician is needed to supervise maintenance of dial access systems. Beyond this, many institutions are able to find students who can operate the system and do routine maintenance. The system at Oklahoma Christian utilizes a full-time engineer, a half-time technician, and about 100 hours a week of student workers. This does not include an equal amount needed for the regular audiovisual operation, and does not include production of software. Maintenance and operating costs per year run between 10% and 15% of the original equipment cost.

Summary

Accounting procedures used by most institutions do not allow for a determination of cost effectiveness. This means that few firm conclusions regarding costs of learning resources can be made with absolute certainty. Only a small portion of school funds has been used for resources including books, so effectiveness on a wide basis is not known.

Learning centers can cost more if use is simply supplementary to traditional methods. If innovative approaches and methods of instruction are utilized, however, cost per credit hour taught need not be greater and sometimes can be even less.

A formula must be found to compute faculty load, (other than credit hours taught and faculty-student ratio), which will allow for greater flexibility in teaching approaches.

Cost of learning centers is approximately the same as any other classroom building requiring laboratories and equipment, such as science buildings. Operations and maintenance costs per year can be expected to be between 10% and 15% of the equipment cost.

While cost of dial access audio can be justified, it is difficult to justify dial access video solely on the basis of cost at this stage of its development. Master antenna systems appear to be more feasible at this time.

The use of individually assigned carrels can be justified by student needs for relevance, psychological set, and privacy. The value of individual carrels has been demonstrated in the past in graduate libraries even without mediated instruction.

On the basis of cost, the learning center concept can be feasible by almost any institution if used wisely and can be afforded on the same basis as any other well-equipped facility.

STATUS REPORTS

A TECHNICAL SUMMARY: THE DEVELOPMENTAL APPROACH TO LEARNING

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Introduction

The opening of its unique Learning Center in June, 1970 paved the way for Dallas Baptist College to implement its developmental approaches to learning that had been in the planning and experimental stages for the past three years.

These approaches are "developmental" in the sense that they seek to individualize instruction for each student with a curriculum that is designed to meet his needs at the crucial period of late adolescence. They are "developmental" in the sense, also, that they seek to encourage desirable affective change as well as cognitive change on the part of students.

Attempts to individualize instruction are common in today's educational world. Other private or church-related colleges share a concern for producing constructive affective change in students' lives.

Few colleges, if any, have attempted, however, to individualize the entire curriculum to enable students to move through complete degree programs at their own paces and according to their own learning requirements. Few colleges, if any, are seeking to use the academic curriculum as the setting for experiences that can produce affective changes.

The importance of the Dallas Baptist College approach is intensified by the fact that these unique programs are being attempted with a student body composed largely of commuting students. The majority of the college students in the nation are commuters. The discovery of instructional approaches to enrich and expand the learning experiences of this type student could have a significant effect in higher education.

This paper will summarize the planning and experimentation conducted by the college to create this new approach to undergraduate instruction.

Design of the Curriculum

Good planning always proceeds from ends to means. Too often innovations in higher education have failed because they represented improved ways of reaching unimproved objectives.

Dallas Baptist College followed sound principles in giving a great deal of time initially in 1967 to a restatement of its educational objectives. From these redefined objectives came the educational program plans and facilities designs for attaining them.

These curricular objectives, as stated in the college *Bulletin*, emphasize the development of the individual, the acquisition of interpersonal skills, the choice of and preparation for vocation, the development of ethical concepts and values, the role of the individual in a democratic society, the importance of physical well-being, and the appreciation of the creative arts.

To reach these objectives, a curriculum had to be developed around certain guidelines:

1. The basic unit of instruction is the individual, not the group or class.
2. Each student should enter the learning process at points appropriate to his individual needs.
3. Objectives for the learning process should be stated in behavioral terms to facilitate evaluation of student progress.
4. Objectives should include affective results as well as cognitive results stated in a hierarchy of relative levels of performance wherever possible.
5. Basic information transmission should be accomplished on an individualized basis through the use of electronic media, e.g., television and tape recordings.
6. Small group discussions should provide the means for the accomplishment of higher intellectual and interpersonal learning objectives.
7. Individual counseling by faculty with students is to be a fundamental part of the learning process.

During 1967-68, faculty task forces began designing freshmen courses in English, religion, and history using these guidelines. Since that time, curriculum development activities have spread to American history, **mathematics,** biology, nursing, physical science, music, German, education, psychology, sociology, and business administration.

It is the stated goal of the college to have the entire curriculum of the college redesigned by 1975.

A Director of Curriculum serves as a staff associate to the Dean of Academic Affairs to guide the translation of the curriculum to the developmental approach.

The Instructional Process

The instructional process at Dallas Baptist College is designed to shift the responsibility for learning to the individual learner. The goal is to help the student become an active agent in the learning process not merely a passive receptacle to be filled with information.

Basically, the learning process at Dallas Baptist College is divided into two major areas--(1) individualized learning activities and (2) small group learning activities. Of course, there are occasional large group lectures and off-campus learning opportunities. Laboratory activities provide specialized learning experiences in the sciences and related fields.

From the standpoint of the individual student, the following steps take place in the learning process:

1. The student is evaluated upon entrance to the college to determine his unique learning characteristics, requirements, and interests.

2. The student is assigned to a counselor-instructor who guides him in the formulation of his program of study.

3. The student progresses through individualized units of study in various selected courses. He is evaluated on his ability to perform the behavioral objectives for each unit before continuing to the next unit. Assistance is available from instructors if the student has difficulty with any unit.

4. The student attends scheduled small group discussions related to each course. Instructors leading these sessions draw upon the individualized study units completed by the students prior to attending the seminars.

5. Evaluation of the student's performance on the individualized units and on the discussions in the seminars is accomplished by randomized testing made available on an individual student basis.

6. A student's progress or lack of progress will determine the amount and types of assistance given him by the instructors. Instructors may reassign students to other seminar groups to encourage learning.

7. Continuous and cumulative progress records are maintained for each student. Future learning strategies are recommended to the student by instructor-counselors on the basis of these data.

The individualized instruction units are prepared by the faculty of the college. Assistance in planning educational strategies, defining behavioral objectives, writing scripts, selecting graphics, and producing media units is provided to the faculty by the media production department of the college.

Each instructional unit is designed for a specific purpose in the curriculum. Portions of commercially prepared educational materials are used whenever appropriate and effective. Suitable commercial materials are extremely limited in most senior college fields at present.

Programming techniques for these instructional units vary from tightly programmed stimulus-response units to lectures on videotape. Where possible, the visual medium is used to illustrate or simulate actual observation for the student.

In planning the learning strategies for each course of study, the faculty attempts to utilize a variety of informational media ranging from books to television. It is hoped the student will begin to develop his own skills in retrieving the specific information he needs from a number of available sources.

Evaluation of each learner's progress is vital to the success of the system. Traditional grades become irrelevant when replaced by hierarchies of behavioral objectives for each course which describe actual performance in specific rather than symbolic terms. Of course, the ability of the student to transfer to other institutions requires the college to be able to translate these performance reports into grade averages if transfer is desired.

And, evaluation of the instructional system itself is very important. A continuing program of educational research and development will be conducted in the system. Faculty from the department of psychology will design and conduct research projects to evaluate various aspects of the instructional system. Liaison is being sought with graduate schools of education and departments of psychology in nearby universities to offer the system as the focal point for possible field studies and dissertations in the areas of curriculum, instruction, and learning theory.

The Undergraduate Record Examination is required of each Dallas Baptist College graduate. This new evaluative instrument will provide national norms from similar colleges with which to compare the effectiveness of the developmental approach.

Faculty Training and Performance

The developmental approach to instruction requires a modification of the instructor's perception of himself as a teacher. In traditional approaches, the instructor is the primary agent transmitting information to the student. The process often is concentrated not on the student's performance, but on that of the instructor. In this pattern, too often the student succumbs to the temptation to become a passive receiver.

In the developmental approach to instruction, the focal point is the student. He must assume the responsibility of an active learner. The instructor performs the role of a mature learner who guides, coaches, counsels, motivates, assists, and evaluates the student. But the real burden of responsibility is--as it is in society--on the learner himself, not on the instructor.

This shift from performer to helper requires real effort and training for many instructors. Dallas Baptist College is designing and implementing training programs for its faculty to facilitate the development of the attitudes and skills needed to make the new approach work.

Training opportunities in instructional media preparation have been offered. Programs in small group leadership techniques are being conducted. Faculty members have been active in attending off-campus workshops, institutes, and seminars related to various areas of the new program.

Facilities for Individualized Instruction

The implementation of the developmental approach to instruction called for facilities to help the student move as an individual through the process. Traditional classrooms obviously provided little assistance at this point.

The need was to place the student in a flexible learning environment in which every possible information source would be available to him. The student would need access to books, periodicals, reference works, microfilms, motion pictures, slides, recordings, videotapes, instructors, other students, and even sources of information off-campus.

The Board of Trustees in July, 1967, authorized the planning and construction of such a facility to be known as The Learning Center. Using the curriculum and instructional plans as the criteria for design, the administration and faculty of the college collaborated with educational and electronic consultants to develop space requirements for the new building. The college architect translated these recommendations into the attractive and functional building which opened in June, 1970.

Erected by T. C. Bateson Construction Company at a cost of $1,650,000, The Learning Center contains approximately 90,000 square feet of floor space in three floors and a half basement. The building houses the college library of 55,000 volumes, with an ultimate capacity of 150,000 volumes. Presently, it is equipped with 812 carrels for individualized study and has a potential of 1,200 carrels. Of those which have been installed, 724 are equipped for television reception. There are faculty offices, administrative offices, seminar rooms, and conference rooms located throughout the building.

The third floor of the building has not been completed by the college for use at this time. It will provide space for future expansion as needed. It is estimated that the present space in the building will accommodate instruction for approximately 3,500 students which is more than double the institution's current enrollment. With the college curriculum completely individualized by 1975, it is entirely possible the present enrollment can be doubled or tripled without the addition of other general purpose classroom buildings.

The Learning Center is attractively designed and decorated to make it a warm, exciting place in which to learn. Carpeting throughout the building adds to its beauty and aids in reducing the noise level in the study areas. Study carrels have alternate designs to bring variety to the interior.

Furniture in the reading areas is upholstered in lively tones and fabrics to avoid a "technological" coldness in the carrel areas. Carrel chairs are designed to give additional support to offset fatigue.

The carrels are a custom design, manufactured by McNeff Industries of Dallas. They are larger and more spacious than commercial carrels. In order to allow for possible rearrangement of floor patterns, the carrels are not attached to the floor except by the electronic supply cables that can be disconnected and hidden beneath a floor baseplate.

Each carrel contains a 9-inch high resolution television monitor. A conventional touch-tone pad allows the student to retrieve from the electronic system any one of twenty television programs at any given moment. He also has available at the same point in time any one of eighty audio-only programs.

The carrel has a lightweight headset for the student to receive the audio portion of the program without disturbing other students. The carrel also has an electric power supply to allow the student to use a tape recorder, electric typewriter, slide projector, or small movie projector if he wishes.

Each faculty office, administrative office, conference room, and seminar room in the building is equipped to receive all television and audio programs available in the system. The television receivers in the seminar and conference rooms enable small groups of students to view certain programs together in color.

Two specialized bays containing forty-four carrels each are located on the second floor for instruction in languages and other audio-oriented subjects. These carrels have no video input, but are capable of allowing students to talk via microphones in each carrel to an instructor at a central console. These carrels may receive all forty audio programs from the central source and some thirty-two additional audio programs from the console in each special bay of carrels.

Forty-eight of the television-equipped carrels are equipped with two-way communication capabilities to off-campus sources. These carrels permit a student to sit in his carrel on the Dallas Baptist College campus and participate in live discussions with faculty and students on other campuses via two way . . . see and be seen . . . television. This television capability extends from Dallas Baptist College to all its sister institutions in TAGER, the closed circuit television consortium linking all major institutions and industry in the North Texas area. Various courses are offered for credit at Dallas Baptist College from other institutions using the TAGER system.

The entire electronic retrieval system was installed by F&M Systems, Inc. of Dallas at a cost of $1,121,000. Major electronic components were supplied by Chester Electronics.

The electronic system is capable of delivering audio signals to remote locations off-campus. Video transmission to remote locations would involve the installation of a transmitter to activate this potential capability.

Recording studios, graphics labs, production facilities, and the hardware for the electronic retrieval system are located in the basement of the building. The system is expandable by the addition of recorders and switching gear in a modular fashion.

The system does not employ the services of a computer at present but it is sufficiently flexible to accommodate such an addition should it become desirable. Every effort has been made to plan a facility that can be updated and expanded as educational requirements change.

SELF-DIRECTED LEARNING AT MERAMEC COMMUNITY COLLEGE

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The modern challenge for community college teachers is to clearly define learning outcomes, to contrive learning strategies which assure individual learners of a set of appropriate learning experiences leading to achievement and to require learners to achieve at a criterion level as a basis for validating achievement. This challenge can be easily accepted today in that college libraries contain a wealth of materials capable of matching the needs of individual students; college laboratories are equipped with apparatus and materials to support a diversity of laboratory experiences; colleges are located in communities which supply a diversity of real life experiences; college administrators are anxious to solve the problems of scheduling, registration; and the general public is willing to support education which really meets community needs.

Experimental Self-Directed Learning Program

During the spring 1970 semester at Meramec Community College twenty-eight students participated in an experimental program of supervised self-directed learning. This initial program was designed to answer some of the following questions:

1. Can community college students assume a major responsibility for their own learning?

2. Will efficiencies of time, space and money be increased through self-directed learning strategies?

3. Will students learn as much when using self-directed learning techniques?

4. Do students gain self reliance and continued interest in learning?

5. Are faculty and other staff members comfortable with self-directed learning activities?

The program developed for experimentation envisioned that students might enter the self-directed learning program through two entrance interviews. The first interview with the program supervisor attempted to counsel the individual student as to his responsibility for self-directed learning and to estimate the student's maturity and his motivation for learning. In no case did the entrance interview result in a refusal to accept a student in the program; however, in several cases students decided not to matriculate after the program was carefully described. The second interview with the course supervisor is designed to acquaint the student with the course requirements, i.e., the course objectives, the learning activities and the evaluation procedures. If the student elects to matriculate in the course, the interview continues so as to establish a(n): (1) set of course objectives, (2) arrangement for the acquiring of learning materials, (3) arrangement for tutorial assistance if needed, (4) outline of the working sessions, (5) description projects and papers to be completed, (6) agreement on a completion time schedule, and (7) arrangement for the evaluation of achievement. A flexible contract is now worked out and signed by the student and by the course supervisor. A copy of this contract is filed with the program supervisor, the course supervisor and the student.

Of the twenty-eight students matriculating in the self-directed learning program, at the end of the semester, twenty-one completed the program satisfactorily, five students were reported to be incomplete, and two students had withdrawn completely from the program. Of the students completing the program fifteen received a grade of A, five were awarded a grade of B, and one student received a C grade.

Questionnaires were distributed to students enrolled in the self-directed learning program and to course supervisors. The results of these questionnaries indicate that both students and teachers are satisfied with the self-directed learning program and many wish to continue as a participant in the program. Likewise, the text and library materials, the study guides and other materials appeared to be quite satisfactory.

In attempting to answer the question "Can Community College students assume responsibility for their own learning?" the response both in terms of grades and in terms of the student and supervisor appears to be a very firm yes. This response, however, is somewhat tempered when one considers that the students enrolled in the program were by and large mature, able students with credible academic backgrounds.

The question "Will efficiencies of time, space, and money be increased through self-directed learning strategies?" is more difficult to answer. In total the program involved 82 student credits attempted of which 62 student credits were completed at the end of the term. Student tuition, thus, amounted to 984 dollars of which some 980 was paid out to course supervisors as consultants. Thus, the program cost was approximately 12 dollars per student credit, which is about the same as the costs for direct instruction. The use of facilities appears to be somewhat more efficient, however, in that students enrolled in self-directed learning activities used the library and the laboratories as space and time allowed. Additionally these students tended to use their homes and other facilities in the community as location for self learning.

If course grade can be used as a measure of achievement then this report will include a definite yes to the question "Will students learn as much when using self-directed learning techniques?" In fact the calculated grade point average for the twenty-one students, for which end-of-term grades are available, is 3.66 which is significantly higher than similar calculated averages for other students enrolled in college courses.

The question "Do students gain self reliance and continued interest in learning?" is difficult to answer in that the experiment did not attempt to establish a base line for either self reliance or interest in learning. However, observation of both the student and supervisor responses to the questionnaries indicate that most students were capable of self-discipline with regard to allocating time and effort to self-directed learning. Further, most of the supervisors reported that the students' curiosity appeared to increase as a result of their experience with self-directed learning.

Faculty members and other staff members appear to accept self-directed study as one of several techniques which should be available to their students. Thus, this report can indicate a favorable response to the question "Are faculty and other staff members comfortable with self-directed learning activities?"

The experimental program has been continued during the fall 1970-71 semester. The fall experimental program was changed slightly so as to test several additional hypotheses. These are as follows:

1. That the program be opened so that students might matriculate on a continuous basis with the understanding that grade and credit will be awarded upon completion of course objectives.

2. That students may matriculate in special problems courses as well as regular college courses.

3. That the selectivity and acceptance of students in the self-directed learning program result from an interview with a specific course supervisor wherein the director of the self-directed program and/or the division chairman serves in an advisory capacity.

As of this writing fifty-three students are enrolled in the self-directed learning program. Students enrolled for first semester courses are enrolled for a total of 162 credits, in 33 different courses, with 25 different course supervisors. Students paid a total tuition of $1944 and course supervisors were paid a total $2350--an average of $14.51 per student credit.

Six college divisions enrolled students in the self-directed learning program. The number of students enrolled by divisions varied from twenty-five in the social science division to two in the communications division. Six teachers enrolled four or five students in one, two, or three courses.

A New Kind of College

The continued success of the self-directed learning program and the general satisfaction expressed by both students and course supervisors leads the writer to recommend further expansion of the program through natural growth. Perhaps this natural growth will lead to a new kind of college--a college based on a new philosophy of student learning and achievement.

Writing about the role of a faculty member in such a college--the library college, Louis Shores states:

> In his new role the Library-College faculty member is a counselor to the individual student. He maintains daily office hours not in excess of the time required presently by combined class meetings and student appointments. . .

> As the situation demands, there are seminar or small group meetings. Once or twice a term each faculty member presents a lecture, open to anyone in the college. The content should represent original investigation and contain information not readily available in the library material.[1]

The evidence is mounting that some of the concepts educators have accepted through the years may not be valid, for example:

1. When teachers are teaching students are learning.

2. That students entering a course are, by definition, prepared to achieve the course objectives.

3. That students must be physically present in a classroom or lecture hall to learn.

4. That all students learn via the same mode and at the same pace.

5. That more courses (course proliferation) are required to meet the needs of students.

6. That students can be evaluated and graded by comparing student test scores.

If and when some of the above concepts are seriously questioned colleges will be able to make significant gains in the efficient and effective utilization of available talents, spaces and facilities. Students would be freed to pursue learning individually via the most appropriate pathway; teachers would be freed to serve as counselors, tutors, evaluators, and co-learners; colleges would become learning centers in which its library, laboratories, classrooms, and study facilities would be fully utilized and student achievement would be awarded by accumulated credit.

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[1] *Louis Shores, The Library College Faculty, The Drexel Press, 1966, p. 72.*

The comprehensive community college is committed... "to the policy of providing for all the people a post-high school education which will meet their needs, abilities and desire to achieve."[2] Thus, our commitment is to utilize our own talents, spaces and facilities so as to meet the needs of students requesting these learning opportunities. A professional staff is maintained by the college in order: (1) To make judgments and recommendations regarding the utilization of talents, spaces, and facilities; and (2) To perform the tasks required by our commitment to meet student needs.

I am not suggesting that the classroom and lecture hall will disappear. Rather I suggest that the relationship between student learning and the total college operation may be freed so that many modes of learning are available for many different types of learners. Thus, oral instruction by the instructor may give way to guided individual learning via reading, mediated instruction, laboratory investigation, tutorial instruction and small group learning. Increased focus on individualized learning should create a new dimension in higher education which is equal to the task of "providing for all the people a post-high school education . . ."

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[2] *J.C.D. Board Policy, August, 1968, p. 27.*

7

LEARNING RESOURCES AT OKLAHOMA CHRISTIAN COLLEGE

MARSHALL GUNSELMAN
Dean of Learning Resources

In an ongoing effort to insure its position on the creative edge of modern education, OCC utilizes a single campus-wide learning resources program which is administered by the Dean of Learning Resources. The program is composed of The Library, The Learning Center, The Audiovisual Center, The OCC Press, The Overseas Study Program, and the Telecommunications Center.

The library collection of Oklahoma Christian College, numbering above 60,000 books, periodicals, films, recordings, and pamphlets, is housed on the first floor of Mabee Learning Center. Of the 325 periodicals regularly received, many are available also on microfilm in a special reading room.

Approximately 5,000 titles are added each year and are classified according to the Library of Congress System. The original collection, classified according to the Dewey Decimal System, is being reclassified to conform to Library of Congress designations.

The library participates with other colleges of Oklahoma in OTIS, a teletype network for locating books and other research materials. When located, materials are made available through interlibrary loan. The library, well lighted, carpeted, and fully air-conditioned, creates a pleasant atmosphere conducive to study. Three librarians are available to assist students with their work.

The Audiovisual Center assists faculty members in selecting, producing, securing, and utilizing instructional media in their classes. A graphic artist helps teachers design visual and printed materials. Student projectionists help in equipment delivery and operation. A photographic service makes pictures and slides for class use and for the student yearbook and newspaper.

In September of 1965, Oklahoma Christian College opened its new Learning Center, described by *Time Magazine* as "the Nation's first wholly electronic learning center." Wide interest from all over the nation has been focused on the Learning Center which features a private, individually assigned learning carrel for each student enrolled in the college. In this carrel, 3½ x 4' in size and equipped with a desk, bookshelf, and cabinet the student may do all his study activity. In addition to being an excellent place to do traditional types of study, the carrel is equipped with a dial and headset which enables the student to dial tape-recorded materials of many kinds as a supplement to his study activities. The student may also check out various visual devices for use in the carrel so that he may see slides, film strips, and motion pictures in his own carrel. Tape recorders and television sets may also be used on a check-out basis. One thousand sixteen carrels are housed in Mabee Learning Center. Approximately four hundred other carrels are housed in the instructional modules of the

American Heritage, Upper Division Science, and Physical Education buildings. Oklahoma Christian College was the first, and at the present time only, college in the world to provide every student his own individually assigned carrel.

The Overseas Study Program is designed to give an international dimension to the offerings of the College. Fifteen students each year are allowed to complete one trimester of work while residing in one of three selected foreign countries. The countries vary from year to year and provide for experience in a variety of cultural situations. Each department has one or more special courses which may be combined to make a maximum of thirteen hours that a student may complete by independent study while living overseas.

At least one three-week study tour through which students may earn four hours credit (or may take for non-credit) is conducted each year. A faculty member accompanies the group. A tour of Europe has proven popular and departs the latter part of April after the second trimester has ended and returns before the short session of the third trimester begins. Thus, a student may go on the tour and still complete a full term's work if he enrolls for four hours tour credit.

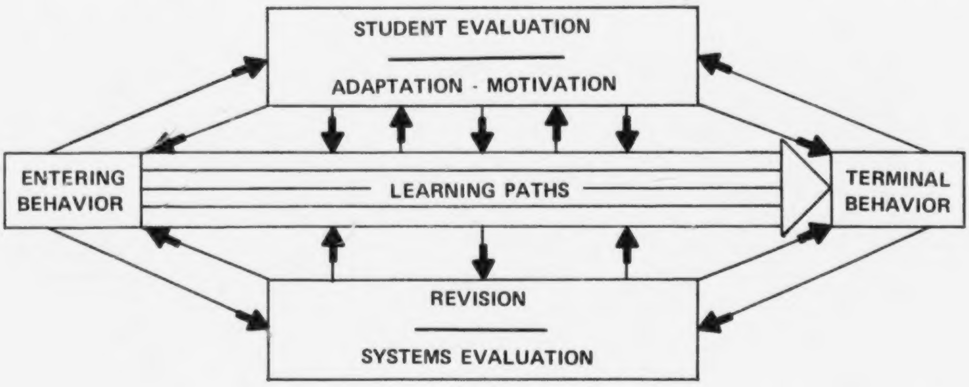
The newest unit of the Program, the Radio and Television Center, is located in the Davission American Heritage Building. A closed-circuit television system has been installed to produce and videotape needed television materials. A recording and radio studio is available to produce audio materials. Work is under way to link this facility with a statewide microwave network of televised higher education which is under development.

An amateur radio club station (WA5ZSQ) links OCC with missionaries and other interested individuals throughout the world. Purpose is to keep students informed about mission activities and to assist missionaries when possible. Full potential of this facility will be realized in future years.

The OCC Press is organized to provide the major portion of the printing needs for all departments of the college. Student notebooks are printed for sale through the campus store and some materials are printed for sale through the OCC Book Store. Although most work is done for use on campus, some bulletins and other materials are printed for off-campus groups.

In order to develop materials and media needed for a changed educational program, faculty members are given released time to re-design course plans. This is usually done on a "minicourse" or unit basis in which all phases of one specific concept are redesigned and developed.

A systems instructional model developed by Dr. Stafford North, Dean of the College, is employed. Objectives (or terminal behavior) are determined first. Then learning paths to guide the student from his initial behavior to reach the objectives are formulated. Methods of adapting to individual needs and motivating the student are considered. Finally a way to evaluate the effectiveness of the instructional system is determined. This system has proven valuable in drawing up a plan for teaching and learning.


STUDENT EVALUATION
ADAPTATION - MOTIVATION
ENTERING BEHAVIOR
LEARNING PATHS
TERMINAL BEHAVIOR
REVISION
SYSTEMS EVALUATION

After the course or minicourse has been designed, work is begun on developing the media, materials, and technology for teaching and learning. Commercially prepared texts, films, etc. may be employed for some concepts. Others may call for campus-prepared tapes, notebooks, transparencies, videotapes,

MABE
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etc. One of the real values of the comprehensive nature of the OCC learning resources program is its ability to utilize a wide variety of talents with a minimum of red tape; to utilize whatever means is best for the concept to be learned. Faculty members work jointly with learning resources personnel in developing the learning paths required for the concept to be taught.

A study conducted by the Academy for Educational Development, a nationally recognized educational research group under the direction of Dr. Sidney Tickton, indicated the following:

> **In general, all groups from whom information was obtained seemed to agree that the Learning Center, and related activities, has had positive effects upon student learning. Students indicated that the individual carrels help them to do better quality work.**

A study of student scores on the Graduate Record Examination indicates a positive gain in all areas. These advances cannot be attributed to specific factors, but do indicate that the total educational environment of OCC is becoming better.

In a comprehensive study projecting College development until 1980, every faculty member recommended continuance of the present learning resources program and further efforts to effect other innovations. Similar judgments were made by overwhelming majorities of students, alumni, and constituents of the institution. None recommended return to former patterns.

A national study for the U.S. Dept. of Health, Education and Welfare by Academy for Educational Development recommended further extension of the utilization of educational technology. OCC plans to be among the first to use these recommendations in establishing pilot programs for demonstration of effectiveness in higher education.

The OCC community is firmly committed to the continuance of the College on the creative edge of American higher education.

LEARNING CENTER REPORT FROM ORAL ROBERTS UNIVERSITY

WILLIAM JERNIGAN
Learning Resources Director

Oral Roberts University opened in 1965 with a 20 million dollar investment and 300 freshmen, and a faculty that was "green" when it comes to utilizing advanced electronic technology. Since that time, we've been in the process of learning administratively and also academically. We, over the past 6 years, have pretty much gotten acquainted with our physical facilities, and our biggest concern now is with quality software.

Our organization in the Learning Resources Center is around the concept of a Learning Resources Director. The Learning Resources Center proper has 192,000 square feet. Many of you have seen it and I trust that many of you will continue to come to see us. We are always glad to have you come.

The Learning Resources Center has six floors and is the academic hub of the campus. Located on the first floor are the television facilities, science laboratories, and the dial access control center. The second floor is totally classrooms. The third, fourth, and the fifth floors are for library. The sixth floor is for executive offices. The Learning Resources Center is indeed a multipurpose learning center; so multipurpose that it presents a number of problems to the person trying to use it, not the least of which is a reasonable amount of security. If you are going to build a learning resources center, try to be sure that you define your goals. Define the objectives for your learning resources center and then try to separate the various services of the center in such a way that it will best facilitate learning for the students. We have run into a number of problems in relation to this, and if you have any particular questions, I'll be glad to answer them later. The Learning Resources Center houses all learning resources. The Director of Learning Resources heads the facility. Working with him is a Director of Educational Media, a Director of Graphics, a Chief Electronics Engineer, and the library staff. ORU operates with the philosophy that the key to a quality media program is an adequate library program. We feel that electronic media will never take the place of a quality book collection--the traditional library and the new electronic media should work hand-in-glove.

ORU views its dial access system as being a mass teaching facility. As a result, we are concentrating on those classes that would normally be large lecture classes. In order to get these large lecture classes into the system, the Director of Learning Resources must work closely with the faculty member. The Director of Learning Resources will work with the chairman of the department in which the faculty member is assigned and will attempt to get released time for the faculty member to prepare an extensive media program. If this is not possible, then possibly a special contract can be drawn up for summer work. The Director of Learning Resources also works with the faculty member in the preparation of his course syllabi with special emphasis being given to the student behavioral objectives. At this point the work shifts to the Director of Educational Media who works with the faculty member in the preparation of instructional objectives for each particular lecture, and the format that particular lecture will take in the dial access system. The Director of Educational Media then coordinates all the production with the Graphic Arts Department, the Learning Resources Library, and all other necessary staff. The finished product is usually a tape-slide presentation. We have not made great use of video tape. We have found the tape-slide presentation to be a little more versatile than video tape. The tape-slide presentation is easier to edit and is more economical. Unless there is an absolute need for animation in the production, we will choose the tape-slide presentation over and above the video tape.

Each year many academicians visit ORU. They are very interested in what success we are having with our system and what steps they should take in planning their system. I cannot take the time here to explain our many procedures. If you are interested, I have some materials available that may help you. Please feel free to write me at Oral Roberts University in Tulsa.

INSTRUCTIONAL METHODS AT FORT BENNING

MAJOR HOWARD STANFIELD
Senior Instructor

The principal activity at Fort Benning, Georgia is the U.S. Army Infantry School. Through the use of Building Four, our main physical plant for indoor classes, and a great many outdoor training areas, we produce, as our final mission, the infantry combat leader.

The organization in which I am involved, The Office of the Director of Instruction, has a number of divisions in its organization: Curriculum, Evaluation, Instructional methods, the Library, and the Television Division. At present I am in charge of managing instructional innovations at the Infantry School as a part of the Instructional Methods Division.

The major instructional innovation that we currently have on board and are using is the Edex student response teaching system. We currently have three 200-man classrooms equipped with Edex for both automated and manual programs. A fairly standard responder for five choices is built into the right hand portion of each student desk.

We have one 200-man classroom which is equipped with fifty cathode ray tubes for computer assisted instruction.

Four or five years ago, what we are now using was considered a rather advanced piece of equipment. We find it a little restrictive now for some of the things that we would like to do. I have no control over television as far as instructional innovation is concerned. It has been around so long as far as infantry school instruction is concerned that it is no longer considered an innovation.

This brings us up to the learning center. You may have heard about the volunteer army or Volar. Volar is one of the military acronyms for the movement toward an all-volunteer army. The idea is to eliminate the minor irritants to the service that have been around with us for years and years. You may be glad to know that your sons no longer have to get up at 5:30 or 6:00 in the morning in order to get some place at 8:00 or 8:30. It is now the individual's own responsibility to get to where he needs to go. Reville has been eliminated and many of the calls that were there simply because somebody did not take the initiative to get rid of them.

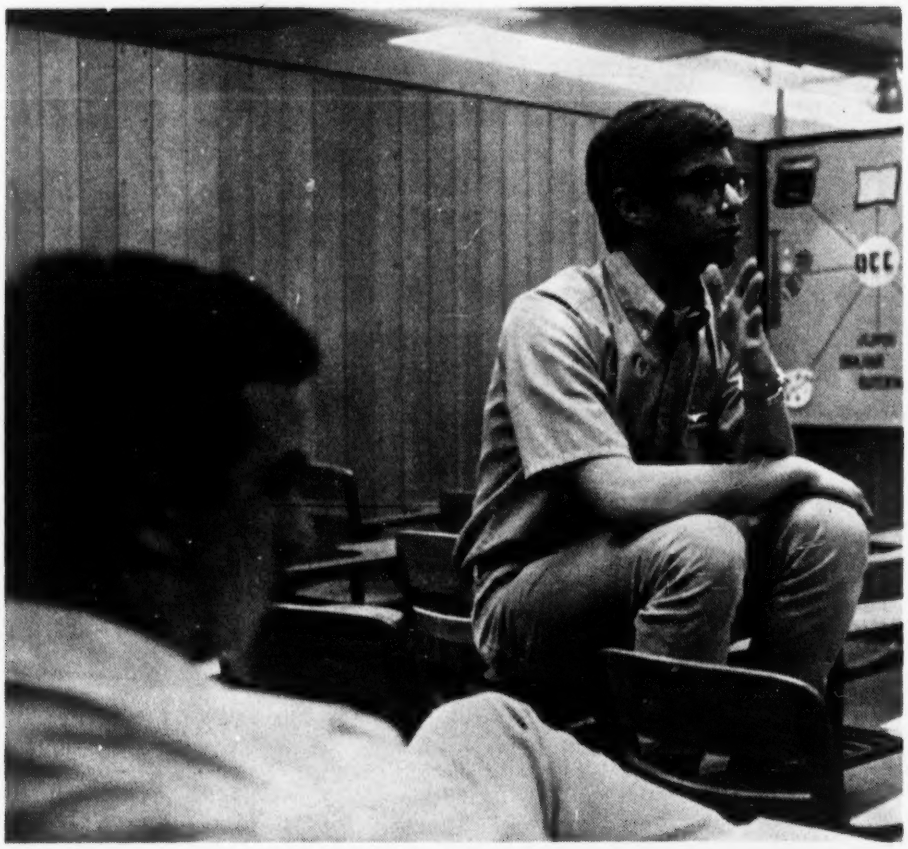
Some eighteen months ago we were talking about the learning center concept, but did not have the funds. Funds have been made available through Volar. We now have open Monday through Friday a pilot project in the learning center. We have converted one of the 50-man classrooms into a center. In it we have thirty carrels using Ektagraphic "E" slide projectors and Norelco Syncro tutor cassette tape players. Additionally, we have four carrels which are also equipped with R.C.A. color TV sets and the capability of expanding to more. We use existing videotape recorders, so a student can get any TV tape that we currently have on board.

We will be in operation for at least six months, much longer we hope. We were funded originally with $30,000 and have spent $21,000 thus far. Our biggest problem, of course, is software. We're taking three different directions. We are providing subject reviews in 35mm cassette format. These are 3 to 5 minute decision problems in which a student is led into a tactical or leadership situation, asked to make a decision, the program stops; he makes his decision, and then the program comes back on and he is told what the school solution or the doctrinal decision would be, and the principles upon which it is based. If he disagrees violently, he has an opportunity to contact the individual who wrote the problem and present his solution. If it conforms to doctrine, it will be included on that tape.

Electives, both in military subjects and more conventional college-level subjects is another direction that we are taking. Additionally we are converting program texts and programmed instruction to this format.

We'd like to open avenues of communication with the educational community by writing or telephone. Our funds are limited, but we would like to possibly trade programs. We could purchase some software with the limited funds that we have in the areas that we need, particularly electives. We have highly motivated young officers, many of them without college degrees, who would like to complete their college training in order to enhance their career potential.

We would like to think that we've done some interesting and valuable work in the areas of race relations and drug abuse. These two problems, if not corrected will seriously interfere with the army's men. Our mission is to produce the world's finest combat leaders. Through our learning center, we're trying our best.


OCC

LEARNING RESOURCE ACTIVITIES AT BRIGHAM YOUNG UNIVERSITY

DARREL J. MONSON
Director of Learning Resources

In February, 1965, all of the diverse activities in the communications, instructional media, and instructional design areas of the university which supported the academic classroom activities were brought together from a number of administrative units into one organization called Communication Services. That division which was renamed about six months ago is now known as the Division of Instructional Services. It has a large, highly trained staff to support the educational activities of what is now the largest private institution in the country in terms of its 25,000 daytime enrolled students. The Division of Instructional Services employs approximately 150 full time people and 250 part time people.

We have much of the most modern instructional equipment that is currently available at any university. This equipment is used in many kinds of instructional systems and various kinds of instructional modes.

The organization of the Division of Instructional Services shown in Figure 1. Work of the Division is coordinated and supported by a number of different agencies on campus. These include the following:

1. At the suggestion of our division, an Instructional Development Advisory Committee has been appointed by the academic vice president. The committee consists of seven faculty members who are outstanding teachers and who are progressive in their utilization of instructional media in course activities. It serves as an interface between the Division of Instructional Services and the faculty as a whole. I serve as chairman of that committee. The committee has a number of functions:

a. It serves as a review body for major instructional programs proposed by the Division of Instructional Services.

b. It calls to the attention of the division any instructional requirements of the faculty in general.

c. It acts as a review body for Instructional Development Program projects as proposed by the faculty.

d. It makes recommendations to the top university administration on matters of policy relating to the overall instructional program of the university.

2. A University Instructional Development Committee consists of one representative from each college at the University. The members of this body act as an information dispersing group who take information to each of their college instructional development committees which they chair.

3. Each college has its own college Instructional

Development Committee which reviews needs and requirements within the individual college.

The director of the Division of Instructional Services reports to the university president through an administrative assistant. He does not report directly to the academic vice president but does maintain a very close alliance with him through individual conferences and the contacts of the Instructional Development Advisory Committee.

Two assistant directors support the programs of the division. One handles the details of the Instructional Development Program and software development. The other handles special services such as accounting and space allocations, as well as overseeing hardware development within the division. Each of these assistant directors serves in a full-time staff position.

At the present time at BYU the Library and the Instructional Services Division are two separate agencies. However, the administrative heads correlate their work with each other regularly. Four joint committees have been formed with members of each agency sitting on the committees to review correlation matters. We are now involved in developing a common bibliographic service, developing basic principles for branch learning centers around the campus, and for the acquisition for both print and non-print materials. Our library has approximately one million volumes and hence is a fairly substantial organization. An example of the way in which these two areas work together is shown in the operation of our Information Retrieval System (IRS), perhaps known more commonly as a Dial Access Information Retrieval System. The audio playback hardware and one-half of the retrieval positions are in the library building itself. The head of the IRS, however, is on the payroll of the Instructional Services Division, but many of the people working under him are on the library staff.

Six departments carry out the work of the division. Each of these is shown on the chart* along with a brief indication of its overall function.

A number of branch learning centers have been and are being set up in colleges throughout the campus. These branch learning centers are all coordinated through the division assistant directors. As noted before, in addition to the branch learning centers in colleges, a learning center is operated in the main library including an information retrieval system with touch-tone access. Audio access and video access positions are also located in many nonacademic buildings on the campus and around its periphery. Equipment such as single concept loop film projectors, slide projectors, audio tape recorders, video playback equipment, etc., are also available at many of these locations.

A department called Instructional Research and Development has on its staff a number of instructional design specialists. Much of the material for the learning centers is produced on campus and designed by these specialists. In addition, an extensive program to acquire commercially produced materials is operated.

Our activities in the instructional development area for the support of the instructional learning centers follow a model that consists of four parts. These parts of the model are shown in Figures 2, 3, 4, and 5. Reference to these figures will give an idea as to how the program operates. Other details of our total operation will be discussed in the discussion sections to be held later this day. The total budget of our operation in the Division of Instructional Services approximates $2½ million. Not only are funds made available for the production and design of instructional materials, but faculty, upon the granting of funds in support of special project proposals in the area of instructional design, are often given released time from other duties to help prepare materials. During the past few years a very high acceptance by the students of individualized instructional programs has been shown. This is true also for faculty, particularly those who have been involved in instructional design.

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*Available on request to author.

Many of the modes of instruction that have been described in the literature are being used at BYU. A few of them we have discarded as being not worthwhile, but in the main we find that most instructional modes have characteristics that make them useful for certain subject materials. Division personnel are busily engaged in evaluating and producing models of instruction, developing various kinds of packages that can be used as models, evaluating different formats of study such as minicourses, many micromini packages, and other types of student active modes. Students are now taking instructional tours of the library, tours of various kinds of facilities on campus, and tours of the campus including botanical points of interest with individualized audio cassette recorders. Video playback systems are widely used both for group viewing and for individualized study. Programmed textbooks and other kinds of materials are being produced. New modes of instruction using many different types of instructional learning activities are being developed. We have now published for three years a bimonthly brochure entitled the "MLS Newsletter" that discusses many of these developments. The initials "MLS" stand for "mediated learning systems." We have also published a description of our Instructional Development Program and include in this document all of the forms that are utilized by both the division and faculty in instructional development projects. All of these materials are available to anyone who wishes to send a request for them to us.

LEARNING CENTER OF LANGSTON UNIVERSITY

MEYER DAVIS
Director, Learning Resources Center

Langston University is a small state supported institution approximately forty miles north of Oklahoma City. The enrollment varies typically from 1,000 to 1,400 students. Our present enrollment numbers approximately 1,200. Our learning resources are somewhat scattered over the campus. The learning center itself, that is, what we call the learning center, is located adjacent to the library. The learning center is an annex of the library program.

A development committee, composed of representatives from each of the academic areas and out of class activities, is responsible for developing and implementing an effective orientation course providing cultural experiences and for integrating the academic experiences through the general education series. Our faculty, along with most educators, believe that with available technology and methodology, education can achieve almost any desired level of student learning. This concept formed the basis for the plan to develop a learning resources center at Langston University.

Before formulating or carrying forward the plan, the Committee, together with other members of the faculty and staff, visited and studied the learning centers in various other parts of the country, notably those in Oklahoma: Oklahoma Christian College and Oral Roberts University. Dr. Stafford North of OCC provided invaluable consultative assistance in the planning of our center.

With respect to instructional media, the faculty took into consideration the characteristics of our student body. Our student body is predominately black, although our enrollment of Caucasian students is increasing yearly. We have approximately forty Caucasian students enrolled this year. In previous years it has been much fewer. So we do take into consideration the educational characteristics of those who come to us.

The students who enter our University come with varying degrees of preparation. A large number potentially capable of college performance come from family backgrounds which have been unable to provide them with the experiences considered minimal in our society. The institution also recognizes its obligations to strengthen and push forward the intellectual and cultural development of those students whose behavior patterns were formed in a more privileged environment. Thus the learning center was designed with the individual student in mind. We are interested in bringing to what we consider an educational standard those students who are woefully below the average and to add to and enrich the backgrounds, as well as the current achievements, of those students from more privileged backgrounds.

Various faculty members in the general education program began making instructional tapes as early as a year before the center was actually ready for use. The learning resources program has produced audio tapes coordinated with manuals or work sheets in a number of different areas; including basic communication, man in society, physical science, biology, advanced composition, effective speech, college mathematics, Oklahoma history, and some others. We have been able to provide additional commercial tapes in most of the areas noted above in order to supplement and enrich the collections.

Instructors prepare worksheets and workbooks to accompany the tapes with our students in mind. The workbooks include diagrams, illustrations, drawings, and other visual aids that the teachers have designed into their courses. While listening to the tapes the student has the workbook before him. The tape may be stopped at any point and reactivated by the student by simply dialing one, plus the number of the tape. He may fill in blanks or take notes. He may also hear the tape as many times as he considers necessary for him to actually achieve the maximum learning from the tape and the workbook. The audio tape method is one which provides many advantages: (1) The preparation cost is low, (2) the tapes can be used over and over as long as material is not outdated, (3) the recording can utilize sound as well as certain principles of learning psychology, (4) teachers may improve techniques, and (5) commercial tapes may serve a great number of students at one time and relieve the teacher of the preparation of materials.

The learning resources center is located in Pate Hall which is the library annex. The two combined, that is, the library and what we call the learning center, represent a large portion of the learning resources assembled for the academic and cultural progress of the student. The center has listening facilities to accomodate one hundred sixteen students at one time with the design to supply a maximum of two hundred forty additional listening stations. Each carrel has sound absorbing walls with a book shelf, and is connected to audio taped materials through Chester Dialog equipment. The learning center also houses a conference room, store room, and offices for the center's director, an office for the electronics specialist, a classroom, and an area for a black materials collection.

The Chester Dialog equipment is the brains of the technical operation. It transmits each student's request, made by dialing three numbers: one to activate the system, two to obtain the specific tape to the playback machine. The Chester equipment connects the student to the taped material he wants to hear, starts the tape, and rewinds automatically, It may be operated manually or by remote control. This system is equipped with four-track machines. There are sixteen tape decks for individual listening, with a potential of sixty-four programs. In addition to the Chester Dialog system, we have a number of tape recorders which can be used to play back any tape that is not a current program. The recording console can duplicate master tapes at several different speeds. Also, eight copies of ¼ track to ½ track monaural and stereo tapes can be made at one time.

Recording is done for the most part at the studio, which is housed at Hamilton Hall, a recently completed campus building. Two clocks within the system control up to eight lectures at once and can be prescheduled for group or class listening. Instructions are permanently fixed to each individual carrel for operation of the sets. Individual schedules are also attached to the carrel in order that students may determine when each tape is programmed and the duration of time it will be on the system.

The center is under the direction of our Dean of Academic Affairs. In addition to the Dean, the staff is composed of a director, an electronics specialist who is also an audiovisual specialist, a night supervisor, a secretary, and several student aides.

LEARNING RESOURCES AT TARRANT COUNTY JR. COLLEGE

VIRGINIA CLARK
Automated Services Division

Tarrant County Junior College is a relatively new institution, organized in 1965. It is still very much in the developmental stage. One important phase of our development is the increasing awareness that we have need to unify the organization of instructional materials services. Tarrant County Junior College is a campus community college with central offices in downtown Fort Worth, which is the county seat. Ultimately there will be four campuses, one in each of the four quadrants of the county: southeast, northeast, northwest, and southwest. Ours is a unified college system, a federation of semi-independent campuses. Each campus reflects its own unique student body, its own unique curriculum, faculty specialities, life style, architectural style and layouts.

The South campus was developed first, opening in September, 1967. Its architecture is modern with a plaid overtone. The learning resources center building is near the middle of the campus and has tall columns out beyond its glass walls.

The Northeast campus opened in 1968. Its architecture too, is modern, but it is reminiscent of the medieval walls without windows, towers, and tourists. The Learning Resources Center is near the middle of the campus and is the center of our whole teaching-learning program. The other campuses are still in various stages of planning, but eventually we will have at least four.

Enrollment has exceeded all expectations since we opened in 1967. Our original projection was 1900 students, but we had 4200, and in 1971 there are 11,000 students enrolled.

We recognize three modes of instruction: classroom presentation, individualized study, and student-teacher interaction. We believe that unified organization and services are more efficient and less expensive than divided efforts. Our Dean of Learning Resources, Mr. Paul Vagt, is one of the officials who unifies or makes our unified efforts possible. Another district official is Mr. Justin Niemever, Director of Technical Automation Services. These men serve both campuses in our Learning Resources Centers. In the first few years of our existence we had a Director of Library Services and a Director of Instructional Media. The library director was over print materials and the media director was over production, cataloging, and retrieval of non-print materials. The concept was that of being separate and yet equal.

In 1968, the units merged under one Dean of Learning Resources. We began overlapping some of the functions, especially in administration and processing of materials. We also have some areas of partial overlap in budget, curriculum design, and student retrieval of materials. But we are not through yet. We are studying this type of design for the future to become more and more integrated--total administration, budget, selection, ordering, cataloging, and processing of materials both print and non-print. What we now call the library would then have the function of materials dissemination; reference and research aimed primarily at the individual student. What we now refer to as instructional media would then be responsible for curriculum design, materials production, and support services aimed primarily at the classroom.

Presently we have on each campus a president, a dean of students, a dean of instruction, and a dean of learning resources. The Dean of Learning Resources is common to both campuses, being responsible to the President of each campus. Under the Dean is the Director of Library Services and the Director of Instructional Media Services. And, there is also a Director of Automation Services. In the future we want to progress to an organization in which we have an associate dean for instructional development and an associate dean for instructional design.

Presently there are three professional staff members at the district level and five at each campus level, for a total of thirteen. We also have technicians and clerical positions, not to mention numerous study and student assistants. The ratio of full time professional staff members to the instructors is 1 to 20.

Originally on the South campus we began with an audio-retrieval system which was not dial access; it was just direct access. It provided nine or ten sources. When we went into the Northeast campus we provided dial access with both audio and retrieval capabilities in large laboratories which we maintained during the day and until ten o'clock every evening.

Since the advent of portable cassette tape recorders, we have started moving away from dial access because of the locked-in situation. The student does not have enough control over the program. We are moving in the direction of individualized pieces of equipment, primarily cassettes. We also have twenty-one slide projectors, permanently installed in carrels.

A learning center within our media center has forty-eight carrels with dial access, five with cassette-slide arrangement, and in the reading room of the library, we have sixteen additional carrels. In addition, other dry carrels are available in the main reading room of the library. About a third of the floor space is devoted to carrels and a third to tables and chairs. A typical programmed package would include print and non-print, video and non-video materials. These changes in facilities have brought about change in our circulation duties. Until recently, all non-print media was circulated by the instructional media personnel from the programmed learning center; but now circulation of cassettes, filmstrips, multi-media kits, and other materials that are not on the dial access system have been transferred to reserved shelves behind the main circulation desks. The division of work in circulation is now according to *functions;* that is, whether it is to the individual or whether to a class group. The main desks handle circulation to the individuals while others handle programmed learning, dial access, other materials which go to the classroom.

We have had centralized automated acquisitions, cataloging, and processing of book materials since the beginning of the college; but non-book materials have heretofore been handled by the various sections of the instructional media department. Now the Automation Division is beginning to work with all types of material. We use the Library of Congress machine-readable cataloging format for all forty-one categories of the audiovisual materials we hope to handle. We will have access to the MARC tapes. These machine readable cataloging materials will be supplied by the Library of Congress in the near future on books, but we don't know when other materials will go on market. In the interim we will have to do our own cataloging. But we are putting it in the MARC format as closely as possible.

Our computerized catalog until recently has been in book form in the separate volumes for author, title, and subject. These are spread out on a long table at the front of the reading room. Other copies may be found at other places in the library and other areas of the campus, so that it's easy to get to the catalog. Increasing bulk and the ever-increasing cost of keeping this printed catalog revised has led us to try a cassette microfilm catalog. We believe that it will be quite satisfactory, as well as being much cheaper and much easier to update frequently.

The microfilm catalog is used with a microfilm reader. It reminds us of a television set the way students are fascinated by it. At present we have seven readers on each campus. We probably will add others later. Our graphics department has provided an operator's chart which is displayed by each microfilm reader. The operation is very easy and consists of selecting the cassette by author, title or subject, inserting the cassette, activating the machine, and rolling the film to the desired place. This is instead of flipping the pages of a catalog to locate the entry.

Our learning resources centers are full service centers providing books, indexes, periodicals and microfilms. Standard 35mm readers and prints are provided in a number of styles and makes. We have the ERIC research materials on microfiche for the faculty and the Newbank Urban Affairs Library on microfiche for the students. This consists of copies of selected newspaper articles on various current and historical topics, thus providing the student for the first time at the junior college level with primarily source materials. And, of course, we have the ever popular xerox copiers on each campus.

Wet carrels, or activated carrels for individualized instruction, are provided in classroom as well as in the learning resources center. We have set up satellite centers in outlying buildings, such as the Science building, academic classroom building, and so forth. Some of our classrooms in large lecture halls are provided with rear screen equipment and automatic lectures.

We have a well-staffed scheduling and distribution center on both campuses for maintenance and storage, motion picture distribution, and television production. We have a full studio on one campus and a complimentary mobile unit on the other campuses. We also have a fully staffed graphics production center on each campus which does a lot of local production. This is only a quick overview of the program of Tarrant County Junior College.

THE EDUCATIONAL RESOURCES CENTER OF WESTERN MICHIGAN UNIVERSITY

NEAL SHANKHOUSE
Director

Western Michigan University was founded in 1903 as a State Normal School and over the years it went through a series of name changes from Western State Normal School to State Teachers College to Western State Michigan College and finally to Western Michigan University. Today it is a multipurpose university with an enrollment of about 21,700 students. But the preparation of teachers continues to be one of its primary objectives. Of the 21,700 students in the student body, about half of those are enrolled in the College of Education. Over the past several years, more of the teacher candidates graduating from Western entered the teaching profession than from any other institution in the country.

The College of Education is located at Sangren Hall, which is a sprawling complex on the new campus. The Educational Resources Center occupies the entire top floor of the front wing of the building. The Center has an area of about 18,000 square feet. The Center was the idea of, and general planning was developed by, a university-wide committee which struggled for about two years in the early planning and construction stages of Sangren Hall. They came up with the basic concept that the education community needed to have a center for all the resources in education located under one roof and adjacent to the classes in education. So, they came up with this more or less unified concept. But the difference is that this is a cooperative effort between the University Libraries, the University Audio-Visual Center and the College of Education. With this type of complex budgetary involvement, it becomes an administrative nightmare, but we think it is working.

Let's take a rapid tour through the center. From a central hallway, we go into a reading room to the reference area card catalog in the micro-ERIC center. We have the entire fiscal action of all nineteen ERIC centers and the researching tools that go along with them. If the materials were all in hard cover, they would more than fill the stacks of the center. Then, of course, there are readers and reader printers, and the stacks area, which houses the classified books in education. Materials for some backup areas, such as Psychology, Sociology, bound periodicals, and areas of curriculum enrichment books, courses of study, and units of study are in the textbook section. There is also a depository of all the documents of the United States Office of Education, a few individual study carrels (dry ones I am sorry to say), and the proverbial copy machine. There is a conference room for faculty and student use for committees and conferences, luncheon areas and circular desks. Now we go into the Audio-Visual materials and equipment room. Although we are operating a unified center with a staff dedicated to the unified approach, the physical structure is one of segregation. From this room we service all the faculty in Sangren Hall and education.

Faculty members put in a request for materials, and the center handles the rest. Students in classes may check out materials. Student teachers are served on a free of charge basis for all audio-visual materials they wish to use. There is the graphics classroom, a multi-purpose room which is used for in-service training for teachers of graduate classes in Audio-Visual media, and is very heavily used for introduction to instructional media. Our audiovisual staff spends approximately two hundred minutes with each section of the required course of teaching and learning. There are about forty of these courses every semester. In addition, the room is kept open under supervision a number of hours each week for students to come in to do independent production of audiovisual materials.

The students in teaching-learning can go through our instructional equipment library. They schedule themselves in on their own time and go through the various moves and independently learn to operate each individual piece of equipment. They spend as long a time as they need in each booth. In other words, it is their decision whether they feel they are competent to operate the equipment. An assistant is available if they need it.

There is a photographic laboratory for a class in photographic communications, other units of communications, and also other units in media production courses. A very important part of our program in our graphics production laboratory in which we have a professional graphics consultant who works directly with the faculty in developing materials specifically designed for use by an instructor in his classroom. The consultant has a staff of three student assistants.

Whether by rain, sun or night, the ERC is open with the objective of helping to improve teaching and learning in the College of Education and in the schools of Michigan to which the graduates from Western go. We display the Distinguished Achievement Award for excellence in teacher education presented by the American Association of Colleges for Teacher Education.

For staff, we have a director, an assistant director, who has a background in public schools, five audiovisual specialists, one graphics custodian, a clerical and technical staff, graduate assistants, and about fifty student assistants. We feel that if our program were working any better we would literally have to push out the walls because we are so busy with the demands from both students and faculty. We are getting support in terms of space and we will be expanding into two additional rooms this coming fall. How we are going to get the other space we need, we are not quite sure, but we feel our learning center is worth any effort we put forth.

WHAT ARE WE LEARNING ABOUT LEARNING CENTERS?

--Some Conclusions

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The principal functions of the learning center revolve around personalized opportunities geared to the interests, abilities, and time schedules of each student. The concept of the learning center rests upon at least four segments of learning theory:

1. New instruction should begin where the student is intellectually and motivationally;

2. Learning experiences should be made as realistic as possible through use of conserved experiences;

3. The student should be an active, rather than a passive, participator in the teaching-learning experience; and,

4. As much as possible, the student should be allowed to progress at his own rate.

There are several indications that increased emphasis will be put on learning center-type activities and arrangements during the 70's. Some of these are the following:

1. The swell tide of enrollment has crested in many institutions and will crest in the remainder soon. Attention of the institutions appears to be turning from expansion and toward higher quality educational experiences.

2. There is a major trend toward better management in every phase of endeavor which will elicit response toward accountability in the educational community.

3. There seems to be a rededication of the profession to teaching. With research funds becoming more limited, teachers who were attracted by its former glitter, are redirecting their attention to their first love.

4. Admissions policies are changing rapidly to include persons of an ever-widening variety of ages and abilities. These differences are necessitating teaching innovations.

5. Obsolescence of knowledge is perhaps the educator's greatest challenge. There is a continuous need for "recycling" the knowledge and skills of citizens in all walks of life. Business and industry are now willing to become partners with education per se in this recycling process.

6. Students have become an effective force making it imperative that education provide more usable and dynamic experiences, opportunities, and involvements.

Implications of these indicators for increased emphasis upon expanded uses of learning resources are numberless, limited only by the creativity and willingness of the educator to innovate.

INDIVIDUALIZATION AND PERSONALIZATION

Since learning center usage entails many individualized learning experiences, some educators have erroneously concluded that its goal is individualization of instruction. *Personalization* is the goal, not individualization.

Examination of the chart on the following page reveals the unique benefits that accrue from large class, small group, and individual learning activities. In rectifying the weaknesses of the large class with individual learning, the teacher and student would fail to benefit through the interaction experiences of the small group. In fact each procedure has limitations which can be overcome by the others and each has strengths the others do not have. Personalization requires each procedure to a certain extent in a suitable combination for the greatest development of each student.

Learning centers provide individualized learning of factual information and skills because this appears to be the best path through which to learn them. Large classes are used for the challenge of a lecture or other presentation. This, then, provides time and opportunity for teachers to work with students in small interaction sessions, a function for which teachers are uniquely qualified, but which they seldom in the past had the time for. In combination, all of these techniques personalize education for the student. Technology, resources, and techniques are used by the learning center, not for the purpose of assembly lining, but for the opposite goal of customizing or personalizing education.

TOWARD INDIVIDUALIZATION OF INSTRUCTION

	LARGE CLASS	SMALL GROUP	INDIVIDUAL
Goals:	Needs of Society	Needs of Citizenship	Needs of Individual
Methods:	Presentation	Interaction	Independent Study
Learning Paths:	Lecture	Group Discussion	Programmed Learning
Evaluation:	Average Development	Satisfactory Progress	Mastery
Motivation:	Extrensic	Personalized	Intrinsic
Adaptation:	None	Limited	Complete
Facilities:	Auditoriums and Classrooms	Conference Rooms	Carrels

Designed by Dr. Marshall Gunselman

SOFTWARE

Perhaps the greatest single problem facing learning centers is that of software -- programs and materials of high quality for use with students. Although some materials are available commercially, they are few in number and must be adapted to each situation.

In order to make software more universally usable, it should be developed through a systems approach and packaged in "minicourses" or learning modules. Each module should focus upon one specific major objective and possibly several enabling objectives. Although differing on many elements of content and approach in their courses, each module could be used by any other institution wishing students to reach this objective regardless of which course or sequence it is "plugged" into. The flexibility afforded by a self-encompassing learning module with its own objective, method of evaluation, learning paths, adaptation, and motivation, provides endless possibilities to the creative educator.

During the next few years, at least, each learning center should take responsibility for the development of some software which can be shared with others as well as used within its own institution. An outline for a minicourse plan is found on the next page.

Experience has shown that persons who develop the learning modules need specified released time and structured formulae in order to develop consistently high quality innovations. Consultant assistance and money for materials and resources are equally as essential. This means that time, funds, and emotions are essential ingredients of software development. But the resulting module is generally well worth the expenditure and should be shared with others when feasible.

Most faculty members are anxious to engage in developmental activities. Contrary to popular expectations, few institutions have experienced problems with faculty members in this area when the faculty have been given released time and adequate support to do the work. Some institutions have found that a special contract with the faculty member is a helpful instrument for spelling out the expectations on both sides while others simply lessen the teaching responsibilities for a term. In most instances, unspecified amounts of time and unspecified deadlines have not been very productive.

OUTLINE FOR MINICOURSE PLAN

I. INTRODUCTORY INFORMATION
  A. Title of Minicourse
  B. Class of Which the Minicourse is a Part
  C. Estimated Time Needed to Teach Minicourse
  D. Teacher and Date of Preparation of Minicourse Plan

II. OBJECTIVES (Stated in behavioral terms)
  A. Specific Minicourse Objectives
  B. General Course Objectives Toward Which This Minicourse Contributes

III. LEARNING PATHS (Listed by specific minicourse objectives)
  A. Teacher Activities
  B. Student Activities
  C. Media and Materials

IV. EVALUATION (Listed by specific minicourse objectives)
  A. Student
    1. Initial
    2. Process
    3. Final
  B. Systems

V. PROBABLE ADAPTATIONS
  A. For Advanced or Especially Interested
  B. For Slower or Disinterested

VI. MOTIVATION TECHNIQUES
  A. Extrensic
  B. Intrinsic

VII. SYNOPSIS OF MINICOURSE CONTENT
(This is a short summary of subject matter concepts to be covered)

Learning modules should be developed empirically, with evaluative assistance provided when the faculty member and the learning center supporting staff cannot handle evaluation efficiently. Accountability demands effectiveness, not just innovation.

THE LEARNING CENTER AND TEACHERS

Devices and services which extend and supplement the teacher have a tendency to prosper, while others wane after a time. Learning center personnel should attempt to avoid the mechanical chill which characterizes technology; and emphasize the humanness of their endeavor.

Teachers should be made to feel comfortable with learning center activities. In a broad sense, the greatest need is to educate the profession, itself, to the possibilities of innovations in teaching and learning.

Workshops, fellowships, retreats, institutes, special courses, and other in-service techniques are useful in idea dissemination. Significant changes are brought about through the infusion of new ideas from other institutions and other occupations. Some learning centers have personnel designated to search out ideas to feed to faculty members on a continuous basis.

Institutions differ as to which combination of approaches works best, but faculty members must be encouraged through administrative leadership and time allotment to develop skills and assimilate concepts of innovation if the learning center program is to pervade the total institution.

SPACE, PEOPLE, AND BUDGETS

Space

Space requirements for a learning center are within the realm of feasibility for any institution providing classroom and library space. Even with extra funds for necessary sophisticated equipment, costs usually are no more than equal to that of a science building or other facility requiring laboratories.

There are two keys to design of learning center facilities:

1. Design for flexibility, especially of services and walls.

2. Maintain a continuous participatory committee to work with the architect and with the users of the facility.

Smaller institutions may wish to house the major learning center functions in one building; while larger institutions may want to separate functions into different buildings or have the same functions in different locations on campus. In any event, the major needs are for coordinated efforts toward adequate space planning.

People

Staffing is somewhat a problem because there are virtually no university programs in operation to prepare learning center personnel. Persons with audiovisual, library, broadcasting or engineering skills who show promise for future professional growth are the usual candidates. Personnel of diverse backgrounds bring with them a wide variety of abilities which generally make innovation easier. Yet the lack of specific training sometimes leads to narrow concepts and petty jealousies, especially as to whose field will dominate. Learning center personnel must break away from the restrictions of their former fields and perceive their work in new terms. Personnel not able to do this could be limited in their contributions to the programs, and such an attitude in a learning center administrator could bring disaster.

An effective organizational pattern for a learning center appears to be one in which all of the various functions needed are contained in one operational unit. This combines library, audiovisual, printing, radio and TV, computerized and other forms of individualized instruction into one comprehensive service which is available to students and faculty with a minimum of red tape. The major administrator of the program should be on the dean level and report directly to the academic head of the institution. The platform from which the learning center endeavor is launched is of extreme importance in guaranteeing its acceptance and success.

Budgets

Learning center operations cost money. Many innovations in education require expensive technology just as does modern industrialization in business. Those who set out to reap the benefits should count the cost and be willing to pay the price. As noted previously, costs of a learning center are not prohibitive; but they do cost something and this should be reflected in regular institutional budgets dictated by the functions performed.

Equipment maintenance generally costs between 10% and 15% of the purchase price per year. Efforts to squeeze this mundane cost or to use the funds for more romantic endeavors have usually led to unreliable equipment, a frustrated staff, and a disgruntled clientele. When Dr. Jones is sick and misses class, everyone says "Poor old Dr. Jones!" But when a computer is sick, everyone says, "That low down no good (censored) gadget isn't working again!" Learning centers need a revised Boy Scout Motto -- "Be repaired."

Budgets should also reflect replacement and updating of equipment as it wears out or becomes obsolete. Five to seven years is the average useful life of much of the learning center equipment. Some specialized equipment may require only occasional expenditure in one lump sum, but most equipment budgets should be handled by establishing a schedule of replacing one seventh to one fifth of the equipment each year.

Learning center operations can be utilized to reduce costs in other areas, so the budget need not indicate greater total cost to the institution for instruction. In fact, some institutions have been able to realize modest total savings through extensive learning center usage. The major reflection of learning center budgets, however, should be to insure that students have rich learning experiences.

DIFFERENCES

Present learning center programs exhibit differences, which appear to exist because of institutional emphasis, rather than concept. And. each learning center seems to contribute some unique phase of the total field. Examination of nine selected centers reveals the following:

1. Western Michigan University emphasizes teacher education and has a self-taught audiovisual equipment laboratory.

2. Brigham Young University has an instructional development advisory committee, one member from each college who is in turn chairman of a committee within his college.

3. Oklahoma Christian College assigns each student a carrel for his exclusive use.

4. Tarrant County Jr. College divides learning center work by function -- cassettes and other student used materials are available at the library circulation desks. They also feature centralized automated acquisitions of all materials and a computerized catalog.

5. Meramec College has a "contract" system with students for self instruction.

6. Fort Benning uses student response systems extensively.

7. Langston University does extensive work with students having underprivileged academic backgrounds.

8. Oral Roberts University utilizes dial access as a mass teaching facility and features slide-tape learning sequences.

9. Dallas Baptist College has embarked upon a program to have its entire curriculum mediated by 1975.

Learning center directors feel that differences should exist because the institutions are different. The "flavor" of each institution should be reflected in its learning center. Also, varying strengths and specialities exist at the different institutions which could be shared. Rather than copying another institution, each should develop its own learning center with its own strengths, yet retaining the learning center concept.

SUMMARY

The learning center concept rests solidly upon adequate learning theory. Indications are that more emphasis will be placed upon its functions and types of activities during the decade of the seventies.

With increased emphasis upon relevance and accountability, a renewed concern for effective teaching in higher education is emerging. Self-contained learning modules, able to stand alone as teaching-learning units, are being developed and can be shared by other teachers, institutions, and students desiring to reach the same objectives.

Learning centers are within the abilities and budgets of most institutions and can be made to effect savings which offset their costs. Regular institutional budgets should reflect needed expenditures for operations, maintenance, development, replacement, and obsolescence.

Keys to proper development of learning centers are administrative leadership, faculty in-service training, and center personnel. Staffing of learning centers is a problem because there are virtually no programs designed to train people for the jobs.

Each institution should develop its own learning resources program according to its peculiar needs with emphasis upon personalizing the educational experiences of the students.

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